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CONTENTS FOR SPRING 1959

Ancient Gold and Silver in the Museum of Fine Arts, Boston	2	HAZEL PALMER and CORNELIUS VERMEULE
The Dawn of History in Southern Palestine	8	JEAN PERROT
Ingres and the Classical World	16	NORMAN SCHLENOFF
Building the Fortress of Ollantaytambo	26	J. OGDEN OUTWATER, JR.
A New Painted Tomb at Paestum	33	PELLEGRINO CLAUDIO SESTIERI
Byzantine Military Standards in a Cappadocian Church	38	DOROTHY WOOD
Ancient Glassmaking Techniques: The Molding Process	47	FREDERIC SCHULER
New Explorations at Sardis	53	GEORGE M. A. HANFMANN and A. HENRY DETWEILER
Archaeological News	62	
Reviews of Recent Books	67	
Brief Notices (Books)	72	

ARCHAEOLOGY is indexed in the ART INDEX

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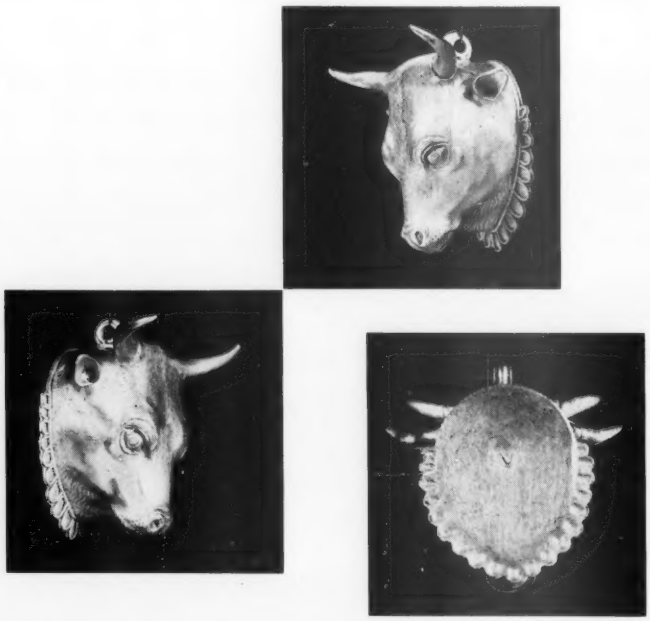
ANCIENT GOLD AND SILVER IN TH

THE TWELVE OBJECTS illustrated here, covering phases of ancient metalwork from Archaic Greek to late Roman, were acquired by the Museum of Fine Arts in 1958. As examples of ancient work in the precious metals, they have the further common bond of coming from areas near the outskirts of the Greek and Roman worlds: the Greek examples were found in western and southern Asia Minor, Egypt and Italy; those of the Roman period came from even more widely separated places, Asia Minor and Britain.

Although the Classical and Egyptian collections in the Museum of Fine Arts have always featured items of all types in gold and silver, the exhibits of mediaeval, British and American Colonial metalwork have needed a more diversified background from the ancient world. The plaques, pendants and bowls shown here were made more for votive or commemorative than for domestic purposes. Some owe their preserva-



GOLD BULL'S HEAD PENDANT. Probably ca. 300 B.C. There are many divinities in Asia Minor in whose worship bovines play an important part, and we may imagine this pendant having been worn by some one dedicated to the cult of a god such as Zeus or a goddess such as Artemis. The chain from which it hung was melted down shortly after its discovery in western Asia Minor. The gold contains a proportion of silver, a common feature of jewelry from the areas where early coinage was in electrum, a natural mixture of gold and silver. The horns and ears were made separately and joined to the bull's head; the former are held by tiny rivets. As can be seen in the illustrations, the back was closed by a flat sheet of gold projecting beyond the neck in ovolos outlined in beaded wires. The details of hair and eyes and the structure of the face are very carefully treated. The date suggested here is open to revision, for the quality of the workmanship transcends ready identification based on style; the pendant may be earlier by at least a century, for there are similar bulls in Attic art of the post-Pheidian period. Length of back plate 3.5 cm. J. H. and E. A. Payne Fund.

tion to burial in hoards or treasures; others were placed in tombs. They span the period from 550 B.C. to A.D. 300. The coins have been selected for their rarity and good state of preservation from about one hundred such Greek and Roman acquisitions during the year.

The photographs were taken by Edward J. Moore, Museum Photographer, and the silver was cleaned by William J. Young, Head of the Research Laboratory.

By Hazel Palmer and Cornelius Vermeule
Department of Classical Art, Museum of Fine Arts

SILVER-GILT HEADS OF GODDESSES. Greek, ca. 540 B.C. This pair of Archaic heads in repoussé relief, said to have been found near Tarentum, were perhaps sculptors' studies or decorations from a casket. Aphrodite or Artemis is the divinity intended. A date shortly after the middle of the sixth century B.C. is suggested by the similarity of the heads to that of the bronze Artemis Daidaleia, a statuette found at Mazi near Olympia (shown above). Height of heads 3.2 cm. Theodora Wilbour Fund in Memory of Zoe Wilbour.

SILVER PITCHER. Greek, fourth century B.C. This and the bowl below, which were found together, probably formed part of the ritual silver of a small temple or shrine. An ovolo and dart design is impressed on the offset ridge of the shoulder. The handle ends in a palmette and has a bucranium, or ox-skull, engraved on the top curve. The workmanship of the pitcher is less fine than that of the bowl. Height 12.4 cm. J. H. and E. A. Payne Fund.

CAST AND CHASED SILVER BOWL. Greek, fourth century B.C. There is an elaborate gilded design of dotted circles, leaves and zigzags on the shoulder, guilloche and elongated tongues on the body. An eight-petaled rosette covers the bottom. The bowl, which comes from a find in southern Asia Minor, can be dated by comparable objects excavated in Greece and along the Ionian coast. This combination of complexity and delicacy in essentially simple design characterizes Greek silver from ca. 450 to 300 B.C. Height 6.3 cm.; diameter 9.8 cm J. H. and E. A. Payne Fund.

SILVER STATER OF PERIKLES (PÄRIKLÄ), KING OF LYCIA (380-362 B.C.). A few of these extremely rare coins, of which this is one of the best specimens, were discovered with a Lycian hoard in recent years. This stater, struck at Antiphellos, has an almost barbarous head of Poseidon (flanked by a dolphin) on the obverse and a warrior, perhaps Ajax, advancing with sword and shield on the reverse. Diameter 2.55 cm. Theodora Wilbour Fund in Memory of Zoe Wilbour.

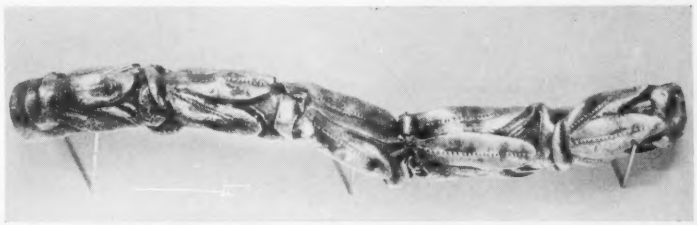
SILVER CISTOPHORIC TETRADRACHM OF THE YOUNG NERO. This coin was struck at Ephesus, probably in A.D. 51. Claudius was still emperor, and Nero is represented at an age when his mother, Agrippina the Younger, was maneuvering to have him made heir apparent in place of Claudius' own son Britannicus. On this particularly well preserved piece, Nero is styled as Consul Designatus and Princeps Iuventutis, titles which were important stepping-stones in his mother's realization of her schemes. The shield and laurel crown completing the reverse design identify the lad with honors paid the first emperor, Augustus, nearly eighty years previously. Nero's face is that of an aristocratic, sensitive Julio-Claudian youth rather than the bloated autocrat of his later portraits. Published by H. Cahn, Münzen und Medaillen, Basel, *Auktion XVII,* 2 Dec. 1957, no. 387. Diameter 2.6 cm. Theodora Wilbour Fund in Memory of Zoe Wilbour.

SILVER OCTADRACHM OF PTOLEMY I, KING OF EGYPT (304-285 B.C.). Alexander the Great's general and successor in Egypt struck a few of these large, medal-like coins near the end of his career. Ptolemy's mint-masters spread revolutionary techniques of mass production in striking coins throughout the Hellenistic world, and the surviving octadrachms (8-drachma pieces) are among the showiest of his new coins. His forceful portrait, diademed and designed in the Alexander tradition, graces the obverse, and the royal name flanks the eagle and thunderbolt on the reverse. The miniscule letter Δ behind Ptolemy's ear may be the artist's signature. This octadrachm was found in Egypt a few years ago. Diameter 3.3 cm. Theodora Wilbour Fund in Memory of Zoe Wilbour.

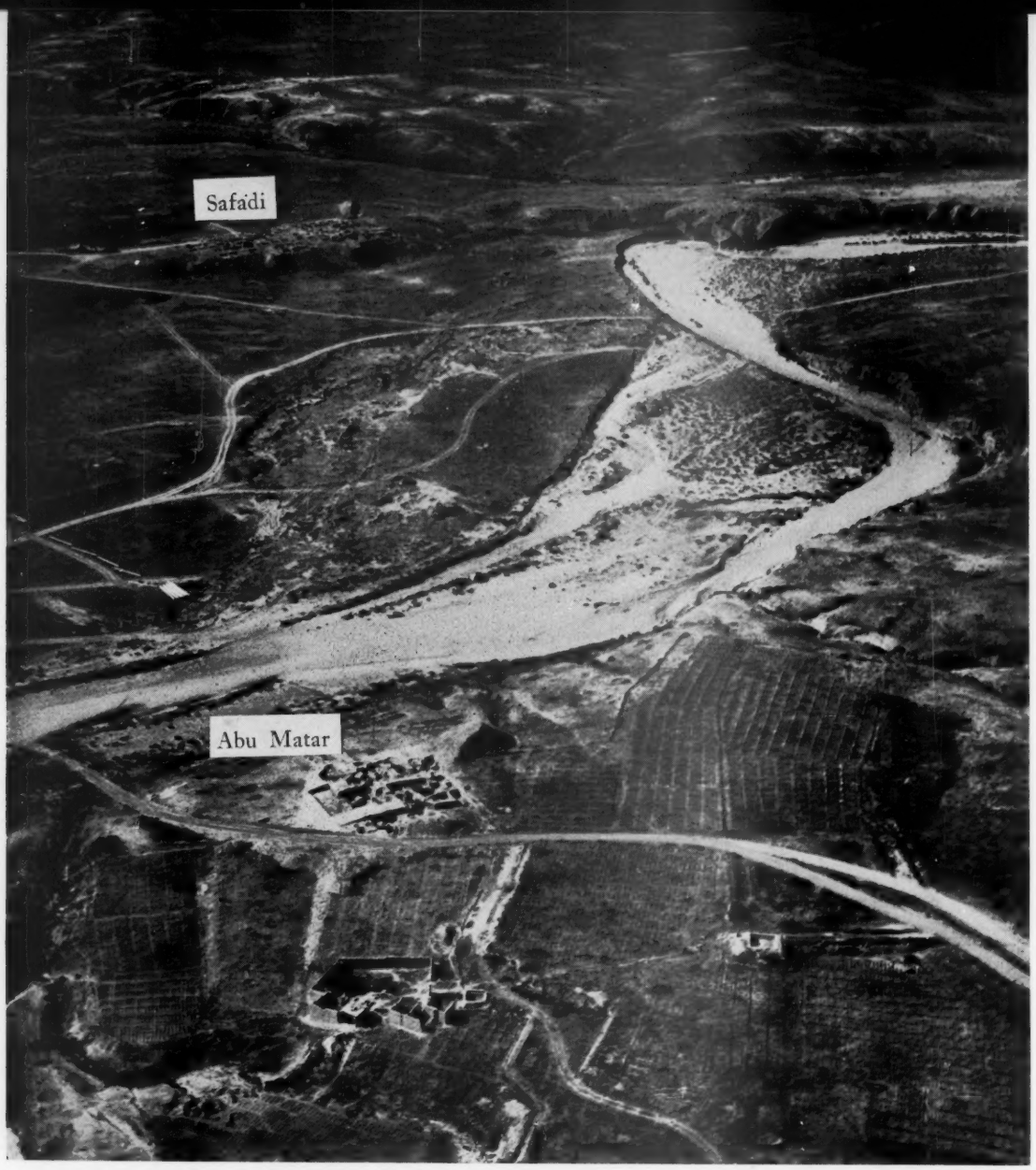
ROMANO-BRITISH SILVER VASE. Probably made ca. A.D. 300. On the rim and offset foot are simple, rather crude designs of raised dots and impressed arcs. Tests indicate the vase was made from silver mined in the British Isles, for British silver differs from most of that used in antiquity in containing a low proportion of zinc. Height 8.2 cm. Theodora Wilbour Fund in Memory of Charlotte Beebe Wilbour.

SILVER PLAQUE WITH BUST OF ZEUS. Roman, probably second century A.D. This plaque was in all likelihood an adornment for a cult statue or part of a priestly costume worn on ceremonial occasions. It was found with the votive chain and the Ares plaque (on next page) at Seki Bazar, between Makri and Elmalı, almost in the southwest corner of Asia Minor. The inscription (both on the plaque and the rim) records that the citizens of Myangla (perhaps the ancient village on the site) commissioned the goldsmith Gaios to make plaque and chain for 303 denarii, including cost of materials. According to alternative interpretations of the local era of reckoning, the plaque was made in A.D. 70 or 180; the proto-Byzantine style of the Zeus, represented in the Hellenistic tradition, suggests the latter. Diameter 15.8 cm. Theodora Wilbour Fund in Memory of Zoe Wilbour.

SILVER PLAQUE WITH BUST OF ARES WEARING HELLENISTIC ARMOR. Roman, probably second century A.D. Two twisted gold wires form a wreath around the helmet, and there are traces of gilding. The inscriptions on the plaque relate that Harmostos, son of Areus, gave the relief and other objects (in A.D. 25 or 135) and Areus, son of Harmostos, joined in paying for repairs on these offerings in A.D. 95 or 205, depending on the interpretation of the era. As in the Zeus plaque, style favors the later dates. Diameter 12 cm. Theodora Wilbour Fund in Memory of Zoe Wilbour.



VOTIVE CHAIN OR WREATH FOUND WITH THE TWO PLAQUES. The short lengths of silver tubing are embossed with a bay-leaf design. Zeus, on the larger plaque, wears a wreath with similar leaves and berries. One cylindrical terminal of the chain is preserved, as well as other sections not shown here. (Length of the section illustrated: 19 cm.) The plaques and the chain probably formed part of the treasure of one or more temples. They may have been hidden at the advent of Christianity, buried by earthquake or looted by barbarians in late antiquity. The names indicate the plaques were made not far from where they were found. The group was published in detail by P. Jacobstal and A. H. M. Jones, "A Silver Find from South-West Asia Minor," *Journal of Roman Studies* 30 (1940) 16; they were acquired through the good offices of the estate of Dr. Jacob Hirsch. They were included in the exhibition of Early Christian and Byzantine art, Baltimore and Dumbarton Oaks, 1947 (no. 358), and E. Langlotz published them again in the sale catalogue of Dr. Hirsch's antiquities (Lucerne, 7 Dec. 1957, no. 61).



Air view of Wadi Saba showing Abu Matar and Safadi. (Photograph taken with the assistance of the Israel Air Force.)

JEAN PERROT was born in France and educated at the École des Beaux Arts, the Sorbonne and the École du Louvre. In 1945 he came to Jerusalem to the Dominican Fathers' École Biblique et Archéologique Française, on a scholarship granted by the Académie des Inscriptions et Belles Lettres. His first field experience was as a member of Father R. de Vaux's first expedition at Tell el Far'ah (Biblical Tirza) in central Palestine. Then as Attaché to the Centre National de la Recherche Scientifique he worked for three years with the prehistorian René Neuville. Exploring southern Palestine, he discovered in 1950, near Beersheba in the Negev desert, traces of an unknown prehistoric culture; the following year, he led a French expedition which excavated, from 1951 to 1957, two 5000-year-old subterranean villages at Abu Matar and at Safadi. Now, as Chargé de Recherches, he is continuing his work in this area.

The following joined the expedition for one or more seasons: Mme. Thérèse Poulain (Josien), of the Musée de l'Homme of Paris, who studied the domestic fauna; Mlle. Denise Ferembach, of the Institut de Paléontologie Humaine, Paris, who studied the human remains; M. Henri de Contenson, who worked on the pottery. Mr. M. Negbi, of the Botanical Department of the Hebrew University, has taken charge of the preliminary palaeobotanical study of the material. The mineralogical analyses were carried out by the laboratories of the Geological Survey of Israel in Jerusalem, under the direction of Prof. Y. Bentor. Assistants from the Department of Antiquities and students of archaeology at the Hebrew University and from abroad took part every season.

THE DAWN OF HISTORY IN SOUTHERN PALESTINE

BY JEAN PERROT

BEERSHEBA LIES in the center of an extensive semi-desert area which stretches from the Gaza coast to the Dead Sea and the Arabah Valley. This is a vast plain of reddish, gently rolling earth cut by riverbeds (wadis), which the short and violent winter rains can fill with raging torrents. Almost overnight the parched browns and grays of the desert change to a tender green and the earth is carpeted with flowers.

Embarking upon the reclamation of this difficult region, the Israelis have encountered at every step the traces of their predecessors: the Nabataean merchants who, shortly before the beginning of our era, founded the caravan cities such as Petra and 'Abda; the Israelites who, under King Solomon and his successors, the kings of Judah, built fortresses in the Negev to control the road to Ophir and protect their exploitation of the copper mines in the Arabah; and, still earlier, the Amorites, the contemporaries of Abraham and Hammurabi. Throughout the millennia, history seems to repeat itself; the Negev has been inhabited only intermittently by a sedentary population. At various times, social, economic or political pressure forced the farmer into the Negev, where he had to exert all his ingenuity to overcome unfavorable conditions. But whenever this pressure disappeared, the settlers withdrew, leaving only nomads to roam the land. Between the waves of population flowing into the Negev there were centuries of oblivion, when the sands of the desert covered the ruins of civilization.

In the spring of 1951, a young man from Kibbutz Mishmar Hanegev, near Beersheba, led me to the banks of a wadi where he had found scattered sherds of coarse pottery and flint flakes. Upon examination and comparison of these artifacts with already known and dated Palestinian material, it was soon evident that they were remains of an ancient settlement going back somewhere in the fourth millennium B.C.—a period of which nothing had been known in southern Palestine.

Our investigations began in June of the same year at Abu Irqayq, on the bank of Wadi Zumeili. Surface surveys carried out in this region by amateurs—almost every *kibbutz* (collective settlement) has its small collection of local antiquities and its "archaeologist"—had already pinpointed about fifty sites along many of the wadis of the northern Negev. All the sites were located in similar areas. In the immediate vicinity of Beersheba, where the underground water-table is easily accessible, the sites were clustered closely together. We undertook the complete excavation of two of these—one near Bir Abu Matar and the other near Bir es-Safadi. (A third site, near Khirbet el-Bitar, has been partly excavated by Mr. M. Dothan of the Department of Antiquities, while a fourth site has been discovered by Mr. Zvi Ofer, curator of the Beersheba Municipal Museum, under some houses in the old town, near Bir el-Ibrahim, the traditional well of Abraham.) Since 1952, seven seasons of excavations have been carried out on these two sites. Our efforts have been richly rewarded and, although the excavation of Safadi has not been completed, we already have a fairly good idea of the material culture and daily life of the first inhabitants of the Negev, who lived fifteen hundred years before Abraham, in the second half of the fourth millennium B.C.

We uncovered almost intact their peculiar villages, not, as normally expected, on the surface of the hills but completely underground, dug, sometimes to a depth of twenty feet or more, into the alluvial loam forming the upper part of the wadi terrace. The nature of the soil favors this kind of subterranean dwelling, which offers excellent protection against the sweltering heat of the day, the chill of the night and the wind-borne sand. It is unlikely that these villages were built in this fashion for reasons of security—the absence of any weapons or fortifications bears witness to a peaceful life such as Palestine has enjoyed only rarely during its history. The earliest dwellings were large rectangular rooms opening on a horizontal gallery on the slope of the terrace. Their shape was not well suited to the soft soil and they crumbled rapidly. Soon the inhabitants preferred to build rows of smaller, rounded or egg-shaped underground rooms, connected by tunnels and entered through vertical

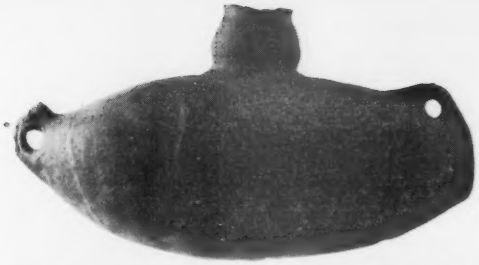
Safadi during the sixth season of excavations. The division of the site into numbered squares measuring 5 x 5 meters facilitates the exact location of each find. The shafts giving access to the subterranean dwellings are visible. (Photograph taken with the assistance of the Israel Air Force.)

PALESTINE CONTINUED

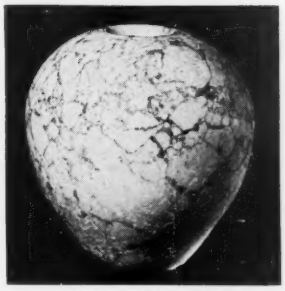
shafts sunk into the end rooms of each row. Footholds cut into the walls of the shafts facilitated descent and ascent. The shafts also assured the ventilation of these dark little rooms, where fires were kindled on small hearths, and which were lit by primitive lamps.

Several times, perhaps as a result of prolonged droughts, the subterranean villages of Beersheba were temporarily abandoned. The galleries were walled up, the shafts blocked and all visible traces of dwellings smoothed away, so that whatever the people could not carry away with them remained well hidden in the underground houses. Sometimes the inhabitants stayed away longer than they expected, or did not return at all, and thus left us to find some of their houses complete with furniture and domestic installations: basins, hearths and bell-shaped grain pits covered by flat stones.

WHEN THE SUBTERRANEAN ROOMS eventually caved in, the people preferred to build round or oval houses in the hollows thus formed on the surface. Built of mud brick on stone foundations, these houses were roofed, at surface level, with beaten earth supported by wooden beams. They are an interesting intermediate stage between the subterranean dwellings and the rectangular houses, also of mud brick on stone foun-

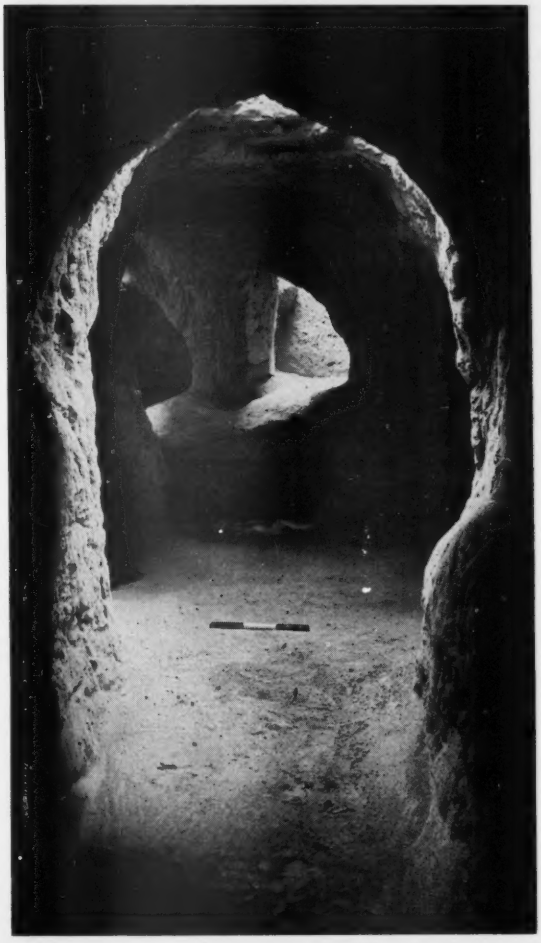


Large vessel, about twenty-four inches long, used for dairy produce; this churn is shaped in imitation of a goatskin such as those still used by Beduin today.



Mace-head of veined white limestone. The mace-heads, mounted on one end of a stick, appear to have been mainly a symbol of authority. Usually they were made of hematite, which is an extremely hard stone, but some are also made of soft limestone, painted with red vertical bands. Diameter about 2½ inches.

Gallery connecting the rooms of a subterranean dwelling.



dations, which still later were built right on the surface. To this last phase at Safadi belongs a large structure which must have served as a public building, although we do not know for what purpose.

The economic organization of the village corresponds to an already high degree of development. Owing to the stability of the natural environment—the presence of a peculiar species of land snail suffices to prove that the climate of that time was the same as today—its economic life can be reconstructed with remarkable accuracy. At this stage hunting is no longer of much importance, while agriculture and cattle-raising provide almost the entire food supply.

Group of basalt vessels, one with hollowed-out foot; these are always found in groups of three. The rim is decorated on the inside with incised hatched triangles; the number of triangles is generally a multiple of seven.

In normally rainy years, the wadis of the Negev preserve sufficient moisture to allow extensive cereal cultivation wherever the soil is fertile. In addition to agricultural tools of stone and bone—picks, hoes and sickles—we found in the storage pits of Abu Matar and Safadi remains of wheat, barley and lentils. The domestic animals were mainly sheep and goats; the dog, the pig and the donkey were known, as well as a dwarf ox, a working animal adapted to local conditions. Handicrafts were well developed, and each village seems to have specialized to a certain degree in a particular craft—pottery-making, weaving, basket-making, the manufacture of objects of stone, bone and ivory. The first specialized craftsmen appear at Abu Matar, where remains of copper smelting and manufacturing were found.

The presence of a copper industry at Beersheba before 3000 B.C. is even more surprising when it is remembered that copper ores are not found in the immediate vicinity. The smiths of Beersheba had to travel more than sixty miles to the rich copper-ore deposits of Wadi Feinan, southeast of the Dead Sea. The fragments of malachite which they brought back were pulverized on flint anvils and, after reduction with charcoal, smelted in earthen furnaces; primitive bellows were probably used for obtaining the necessary high temperatures. After being refined in crucibles, the metal was poured into molds for making mace-heads, implements and jewelry.

In addition to being clever craftsmen, the people of Beersheba were artists of no mean ability. Their sense of beauty found expression even in the most ordinary objects. The graceful pottery vessels are often decorated with red-painted geometric motifs. More costly vessels, made of basalt, include beautiful bowls and stands with hollowed-out foot. Rectangular palettes of polished marble were used for crushing black, red and green face-paints. Ornaments are very numerous—stone and ivory bracelets, beads of frit and shell, pendants of mother-of-pearl, bone and turquoise. Two ivory pins with decorated heads, one representing a bird and the other a human figure, show

Head of a bone pin in the shape of a bird. Height 2¼ inches.

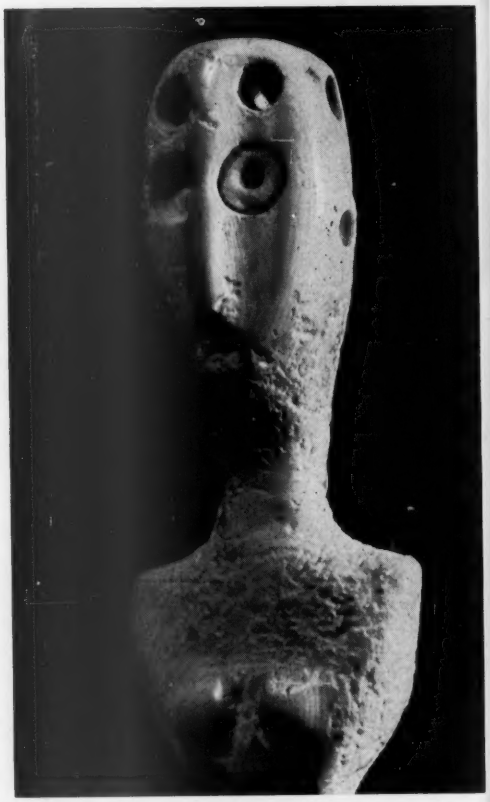
Bone pin with head shaped like a female figurine. Height 2¾ inches.

an artistic sense which is fully revealed in a series of remarkable ivory figurines. Ivory carving seems to have been of particular importance among the crafts practiced at Bir Safadi. We had the good luck to uncover an ivory carver's workshop, complete with workbench, tool—a copper awl still in its bone handle—and raw material, an elephant tusk. Elephants are known to have existed in Syria as late as the eighth century B.C.; however, the possibility cannot be excluded that the ivory was imported, perhaps from Africa, together with the large shells from which beads and other ornaments were made. Our figurines are not unlike the early Predynastic sculptures of Upper Egypt, but the style of the Beersheba ivories is different and they are generally superior in execution. The figurines apparently represent a worshiper standing in ritual nakedness before a divinity; they bear witness to religious concepts which also find expression in schematic representations of humans, animals and sexual symbols, probably connected with a fertility cult. Curious assemblages of pebbles—found on

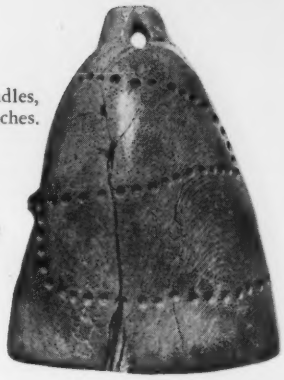
Head of an ivory figurine representing a woman; the hair is gathered on the top of the head and falls down the back in a "pony tail". The coiffure is crowned with an animal(?). Height about 3½ inches.

PALESTINE CONTINUED

Photographs by Arie Volk



Above, left: **Ivory figurine,** thirteen inches high, representing a naked man with hands at the waist holding up a narrow loincloth (broken). Hair and beard were attached by threading through the holes in the jaws and around the head. *Right:* Small ivory female figurine (broken at the waist), made for wearing attached to a necklace. Height 2¾ inches.



Cult object of ivory with tiny lug handles, decorated with a snake. Height 2¾ inches.

Copper awl with bone handle. Length about seven inches.

the floors of the dwellings, and always grouped in multiples of seven—may perhaps point to ancestor worship. These pebbles are marked in red paint with various signs—crosses, darts, squares, pictographs.

WHO WERE THESE PEOPLE and whence did they come? The skeletons unearthed at Beersheba belong to two different racial groups, the Proto-mediterranean, known to have been established in Palestine since earliest times, and the Armenoid (Anatolian), which is known at this time only in the Sumerian cemetery at Kish, and which here makes its first appearance in Palestine. Of the four individuals belonging to the first group, three—a man and two women—had simply been thrown into a disused grain-silo after the man had died a violent death. The fourth skeleton, that of a woman, was found in another silo, lying contracted on its side. The burial customs of the Armenoid group—represented by six skeletons—were different: the long bones were collected after the flesh had wasted away, and were placed against the wall of the funerary chamber, with the skull on top. The main physical characteristics of the Armenoids, a short, broad skull, a long straight nose in line with the forehead, and abundant hair, seem to be exactly reproduced in the ivory figurines. An interesting relationship between race and culture may be glimpsed here, and it might perhaps be suggested that an Armenoid group played a primary role in introducing into Palestine this new element which we call the Beersheba culture.

The Beersheba cultural complex is indeed distinctive. Entirely different from that of the indigenous settled population, it bears the mark of its nomadic origin. The excavations at Beersheba have shown the existence of continuous relations with the Transjordan plateau, from where hard stone (particularly basalt) and copper ore were brought. Metallurgical crafts as practiced at Beersheba could develop only within reach of the rich copper deposits of Wadi Feinan. These and other considerations, which require confirmation by investigation east of the Dead Sea, as well as more general anthropological factors, suggest the eastern border of the Transjordan plateau as the dwelling-place of the Beersheba people just before they came to Palestine.

It would seem that, toward the middle of the fourth millennium B.C., certain population groups east of the Jordan River which were already well on the way to sedentary life began migrating westward. We do not know the reasons for this migration, which may have taken place around the entire periphery of the Syrian Desert. Palestine seems to have been invaded peacefully both north and south of the Dead Sea. The newcomers gradually established themselves in the northern Negev and in those parts of the country which, like the Jordan Valley and the coastal plain, were less favorable to settlement than the central hill country and consequently less densely inhabited by the indigenous population. There they found living conditions and natural surroundings not very different from those they had left.

The disappearance of the Beersheba people a few centuries later was apparently just as sudden as their arrival. The poor soil and marginal conditions of this region must have set a limit to the growth of the population and inhibited the normal development of the culture. Unable to grow, it must have lost vitality and faded rapidly. Perhaps these difficulties, together with a change in general conditions, led to a return to nomadic life. In the present state of our knowledge we can only offer conjectures. It is certain, however, that before the beginning of the Bronze Age in Palestine, even before the first historic dynasties established themselves in the valleys of the Nile and the Euphrates, the Negev once again was deserted.

INGRES

AND THE CLASSICAL WORLD

By Norman Schlenoff

THE INFLUENCE OF THE ANTIQUE on the French painter Ingres (1780-1867) has been remarked by various writers in the past; numerous works of Classical antiquity appealed to this famous artist who subsequently incorporated in his work either a direct reference to them or at least an allusion to their existence. The ancient world was part of the background of all young painters, and toward the beginning of the nineteenth century it became increasingly so. And rightly so, Ingres decided; he himself reinforced its cult and made it an essential part of his paintings. The great masters of all times were a rich source of material for the artist, he declared, but his students were warned not to become their "apes." His own teacher, Jacques-Louis David, had been more direct: he believed that the prototypes of art derived from antiquity were limited and few, but perfect. Nature is more varied, Ingres concluded—"Not one human face resembles another." Thus while he admired the art of the ancients he would not readily admit his indebtedness. The only exception is his advice to imitate Homer, whom all great creators "copy."

Jean-Auguste-Dominique Ingres' interest in the past was evinced rather early and was formulated and directed by his father, who in turn was influenced by the ideas of the Academy of Montauban, of which he was a member. The Academy, supporting the classical principles current during the reign of Louis XIV, favored the seventeenth-century writers of France and the dramatists of ancient Greece. Perhaps Ingres' first encounter with the problem of resurrecting the past came in 1789, when he was nine years old. *Socrates,* a tragedy by Pastoret, was presented by the younger students of the author's boarding-school. "The scene is in the Citadel of Athens . . . in the house of Aristides." Director Pastoret's funds were limited, and we may presume that he called on Ingres' father—the one artist among a small group of friends active in the cultural life of the city—to create whatever scenery there was. Ingres *père* took his son everywhere; and we can imagine the young boy enjoying himself with the others here in the house of Aristides in Athens, that enchanted city of which the savants of Montauban spoke so warmly.

Montauban was part of the artistic and cultural domain of Toulouse, which sent out teachers and ideas to the surrounding country and in turn welcomed the influences that streamed down from Paris. The antiquarian impulse was in the air. What were the Romans and—after 1797, with the changing tide of interest—the Greeks really like? The process of determining this had been accelerated during the latter part of the eighteenth century; Jacques-Louis David, the greatest painter of his day, was deeply engaged in this problem.

The young Ingres was full of the Davidian dream of the antique world when he came to Paris in 1797 to study with the famous revolutionary painter, now reformed. In 1800 Ingres painted *Antiochus, Informed that Scipio Lay Ill in Helle, Sends Him His Son, Who Had Been Taken Prisoner, That Joy Might Cure the Disease of His Body. Indeed, after Holding His Son a Long Time in His Embrace, Scipio Said to the Envoys from Antiochus: "Go and Offer the King My Grateful Thanks."* This work shows the disposition of the Neo-Classical mind, which saw ancient heroes moving among the bric-à-brac of small details enclosed within solemn stone walls. But David's art seemed lifeless, numerous people complained. "Colored marble statues," said Madame de Staël. Characters moved in an airless, breathless world where they were as eternally frozen as the severe morality they underlined.

Attempting to bring this Davidian world to life, the young Ingres produced another painting: *The Ambassadors from Agamemnon, Sent to Achilles to Urge Him to*

1. The Ambassadors from Agamemnon, Sent to Achilles to Urge Him to Fight, Find Him in His Tent with Patroclus, Singing of the Feats of the Heroes. École des Beaux Arts, Paris. Photo Bulloz.

Fight, Find Him in His Tent with Patroclus, Singing of the Feats of the Heroes (Figure 1). Here in his tent the young hero is "assuaging his pain," Ingres writes in his notebook, by singing and harp-playing while Patroclus listens. Into his notebooks Ingres copied from the *Iliad* all the pertinent details that would help him realize his characters. He wrote that in the distance the camp is resting: "the soldiers are occupied with games. The sun sets." Guided by Homer, Ingres has sketched in a scene which is evocative in the selection of details. Yet in order to execute this work the young painter had to be acquainted with the "archaeological" background of such a theme. The critics who would judge the exhibited painting were erudite men who would certainly condemn a "historical" error.

Ingres could draw on numerous books on the costume of the ancients, such as Willemin's extensive work on this subject, which appeared in 1798-1802, or Rocchegiani's two volumes of 1804, which were popular among David's students. But the most impressive work on antiquity, one which was to influence painters for generations to come, was the thin booklet by David on his painting of 1799, *The Sabines*. This was both an explanation of and a justification for that master's concept of the ancient world. He explained that the Greek heroes went unclothed, and he cited numerous examples to prove this point; he argued that nudity was the "ideal" state of the human body—plus, sometimes, some drapery to add dignity.

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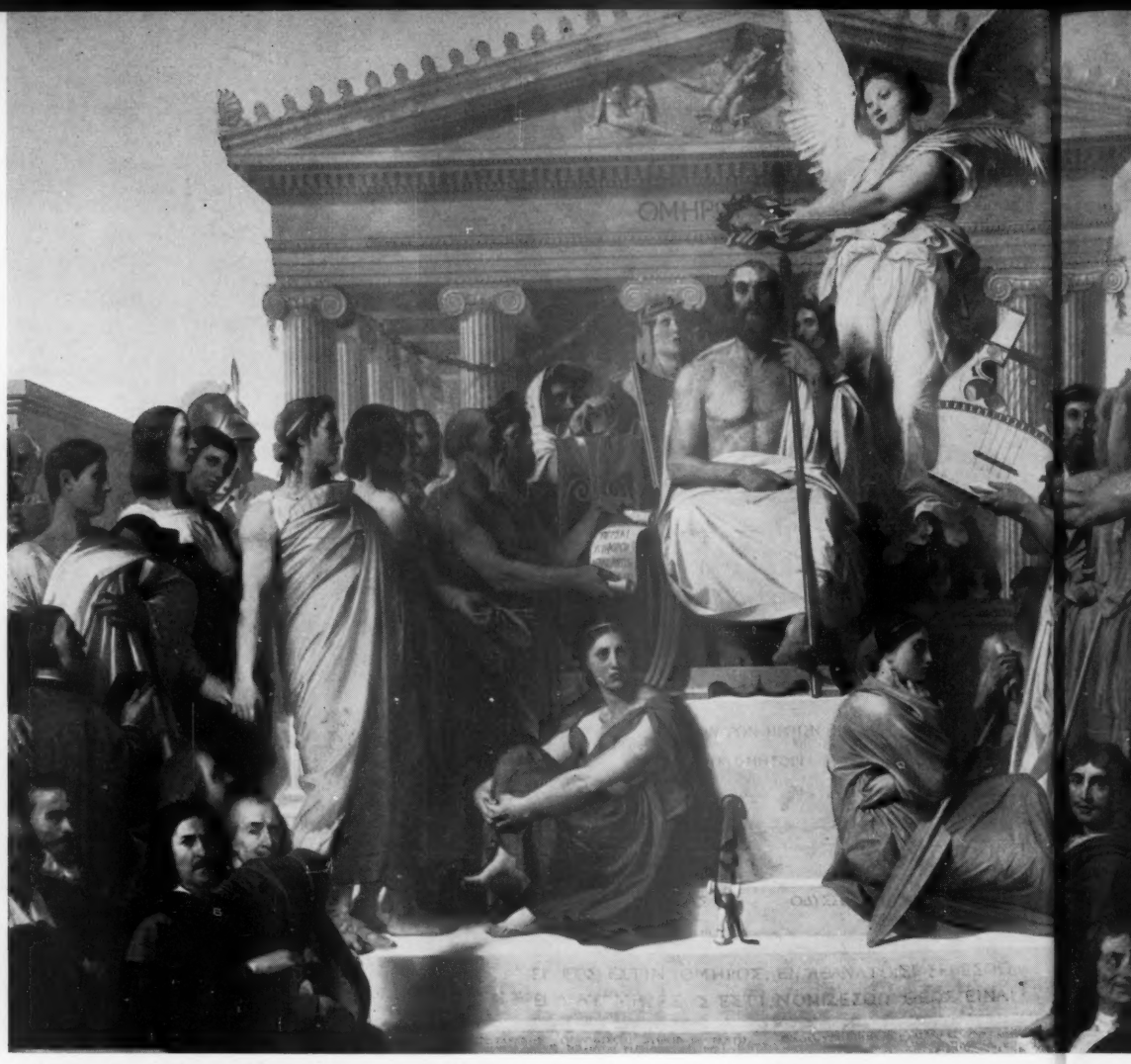


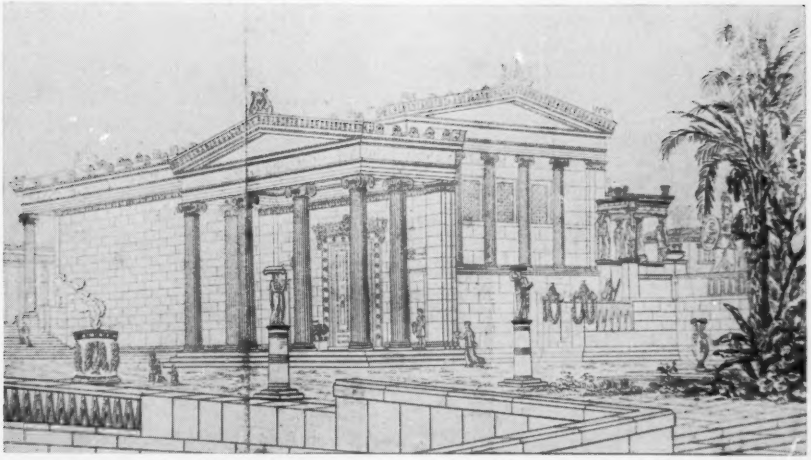
2. Apotheosis of Homer. Musée du Louvre, Paris. Photo from Archives Photographiques.

INGRES continued

This is Ingres' solution too: nude figures in a severe décor, with just enough to indicate the essential elements of time, place, action. A similar process can be observed in his *Thetis Appealing to Jupiter to Honor Achilles,* of 1811, in which the two figures are merely elaborately draped.

The *Apotheosis of Homer,* 1827 (Figure 2), is a major work, in which Ingres' archaeological, or antiquarian, penchant is decidedly evident. Here the rigidly established symmetry is broken by the figure of Victory hovering above the main figure, who sits on a "throne," his feet resting on a footstool (a necessary accoutrement for all great personages, Ingres notes). On a raised stage, or "platform arranged like the proscenium of an ancient theatre," are the great men of antiquity, the *homérides,* as he called them, and below them the modern *homérides.* All encircle the central character of this piece, the theme of which is Homer crowned by Victory.

Homer became a religion to the painter; and it should not be surprising that the scene takes place before a temple sacred to the poet (his name is written on the façade). It is a peripteral structure, with six fluted Ionic columns across the front. Within the precinct of the temple are walls to frame the building, enclose the actors and limit the vision of the spectator. The whole construction does not impose on the spectator any sense of



3. Engraving of the Erechtheum, by Hibon and Réveil. From *Les antiquités d'Athènes et autres monuments grecs d'après les mesures de Stuart et Revett . . .* , by M. Nolau. Paris, 1835.

INGRES continued

its reality; it is rather the lack of depth, the surface quality, that asserts itself.

Ingres' building is derived from one on the Acropolis; he turned to engravings to help him create the scene. Among the books that attempt to restore the lost details of the monuments is *Les antiquités d'Athènes et autres monuments grecs* (1835). The book acknowledges that the buildings are copied *"d'après les mesures de Stuart et Revett,"* but it is *"enrichis des nouvelles découvertes."* The probability that Ingres knew, even owned, this book by the architect Nolau is suggested here because the engravers are Hibon and Réveil; the latter, a friend and collaborator of the artist, often sent him copies of his work. Of interest for Ingres' archaeological penchant are several plates in Nolau's book which furnish clues for the *Apotheosis of Homer,* with its presumably peripteral building. Similar fluted Ionic columns appear in the Nolau reconstruction of the north elevation of the Erechtheum (Figure 3). Ingres seems to retain the proportion of column, architrave and pediment in his own work, also the liberal use of antefixes adorning the border of the roof. Antefixes do not appear in the Stuart and Revett plate of the same elevation (*The Antiquities of Athens,* II, Chap. II, Pl. VII; see ARCHAEOLOGY 9 [1956] 256).

As to the pediment of his curious temple dedicated to Homer, Ingres was undoubtedly helped by Quatremère de Quincy, an archaeological savant of the time, who published in 1829 a work on the reconstructions of the two pediments of the Parthenon. Though Ingres was working on his painting during 1826-1827, before the publication of this book, he was well aware of the projects of this man, who had befriended him on his arrival in Paris late in 1824, and later helped him attain a seat in the Institut de France. Raoul-Rochette, another archaeologist and Hellenist, furnished the Greek inscriptions in the painting. Nolau's book also gives a large place to inscriptions such as Ingres is fond of using.

INGRES' NEXT GREAT WORK carried his temple indoors, where it became a canopy for a bed—with the necessary change in proportions and the columns reduced to one at each corner. This is the *Stratonice* of 1840 (Figure 4). Here the painter transports us to a Greek interior of about the fourth century B.C., furnished with Pompeian mosaics of a later century. Some of the murals are well known: the *Labors of Hercules,* for example. Much, perhaps most, of this polychrome fantasy in the background was executed by two of Ingres' students, Raymond and Paul Balze, though in some later versions the master's hand alone is evident. But there can be no doubt that the whole scene was conceived by Ingres alone. In the careful wooden model for the canopied bed, now in the Montauban museum, one sees Ingres' great concern for the precise disposition of the whole scene and its elements.

During the years when the painter was working on his *Stratonice* he was director of the Académie de France in Rome. There he could dictate to the pensionnaires—the *prix de Rome* students of the Villa Medici—what he thought was a sound basis for an artist's education, Classical archaeology being foremost in his program. The newly created post of professor of archaeology at the Academy went to Signor Nibby, one of the most active

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4. Stratonice. Musée Condé, Chantilly. Photo from Archives Photographiques.

scholars of his time. Although Signor Nibby spent his own fortune on numerous investigations and publications, this was not enough to meet the great expense of his vocation, and his friends gladly subscribed to the many fascicles he circulated. Ingres added this man's works to his own and to the Villa's library.

One can imagine Ingres' delight in discoursing with professional scholars about the books he seems to have prized most, and in encouraging his students to do likewise. In the evening he gathered the young artists together, and in his own salon enabled Signor Nibby to offer something the director thought more appropriate for their careers than the music and dancing they had been accustomed to in the past.

The theme of *Stratonice* is closely associated with the archaeologizing tendencies that pervaded the Villa Medici. Aided by Nibby, the students were able to devote themselves to a study that seemed essential for historical painting. Ingres ordered the librarian Le Go to acquire the important current books on archaeology, which were to become the daily fare of the young artists, whose task was to imitate and be inspired by the ancient monuments, and to incorporate this experience into a style. We find even among the architects a preference for buildings based on antique remains, especially those of Rome. As for Greece, Ingres pleaded for the inclusion of her monuments also as worthy sources of inspiration, but the distance of Athens from Rome gave the students little opportunity to see them at first hand.

The problem was more precise for the painters. In the recreation of a site they could not be expected to invent when they had at hand in the Villa's library a vast number of archaeological resources from the eighteenth century on. There were numerous works on Roman and Greek architecture to help the artist in his research, although the tendency to resort to restorations and to ac-

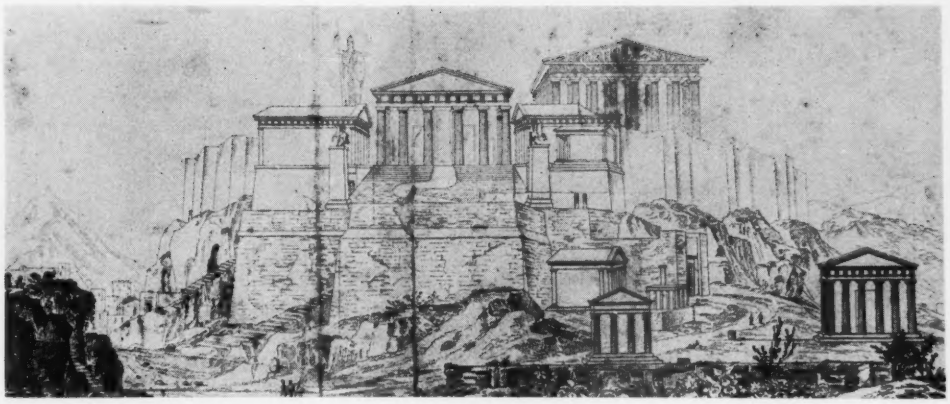
5. Theseus Recognized by His Father, by Hippolyte Flandrin. École des Beaux Arts, Paris. Photo Bulloz.

cept them at their face value was quite common. Still, in the desolation of her lost pristine beauty, Athens restored or conjectured presented an inspiring picture.

Confirmed Ingrist before and after his sojourn at the Villa Medici, Hippolyte Flandrin shows in his painting *Theseus Recognized by His Father* (Figure 5) an aspect of the Parthenon seen from the house of Aegeus, the king of Athens—logically enough at home in the shadow of the great hill, though his reign (calculated in mythological time) antedates the Periclean monuments. Yet against this ardent reconstruction of the Acropolis is developed the story of Theseus' recognition by his father, who thwarts Medea's plot to poison his son. Here is some notion of the *site* (the technical word for the background of the action), mention of which is indispensable for any student at the Villa Medici working on a given theme.

Nolau's first plate, a view of the Acropolis (Figure 6), reappears in Flandrin's painting; here are the Pinacoteka, the Propylaea and the Parthenon, with the statue of Athene Promachos towering above them. Even the small buildings in the book are faithfully reproduced. That the Flandrin painting antedates this book by three years need not argue against an influence: to execute his painting the artist needed the guidance of those established archaeologists who were friends of his teacher. The relation of Flandrin's ideas to those of Ingres is apparent in the latter's *Apotheosis of Homer* and *The Age of Iron,* which have as background similar buildings, apparently based on the Erechtheum.

WHEN HIS DIRECTORSHIP at Rome was over, Ingres devoted himself to the most ambitious enterprise of his career, the Dampierre murals. The Duc de Luynes, connoisseur and author of several books on antiquity, had engaged him to paint a room in his château of Dampi-

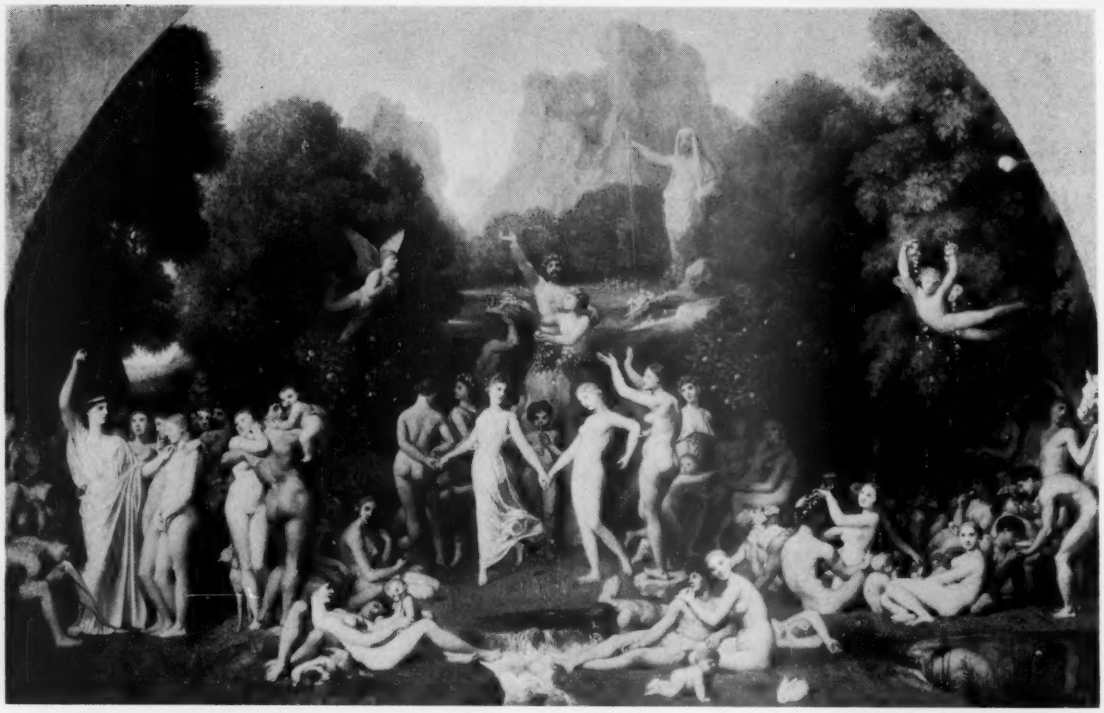


6. Engraving of the Acropolis of Athens, showing the Parthenon and other buildings, by Hibon and Réveil. From *Les antiquités d'Athènes et autres monuments grecs . . .*, by M. Nolau.

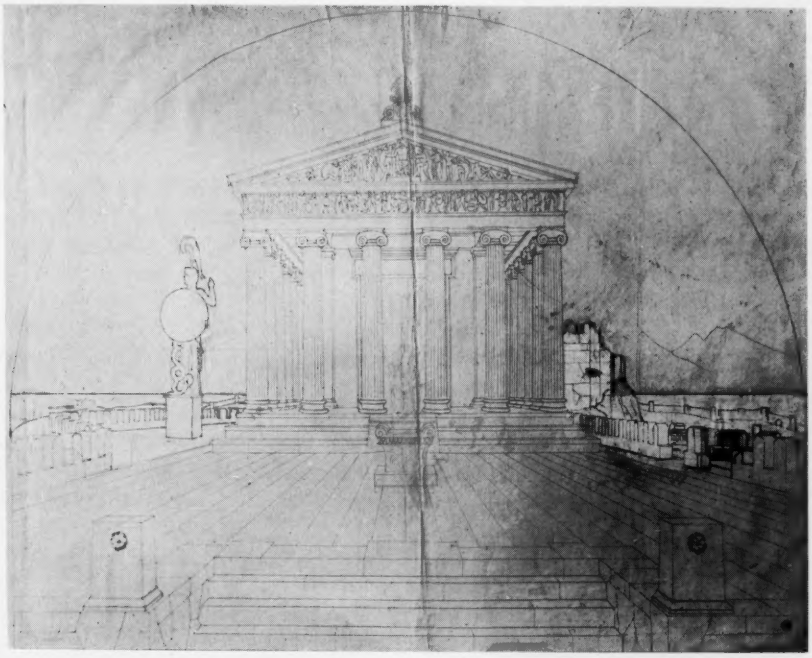
erre. For the famous painter this was an appealing prospect: the decoration of an entire room by a group of painters, architects and sculptors who were to work under his direction. From Ingres' hand alone there were to be two paintings: *The Golden Age* (Figure 7) and *The Age of Iron* (Figure 8). Of these the first was to be, according to the painter's plan, an idyllic representation of that perfect state of man at a time when his condition was comparable to that of Adam and Eve before the Fall, as portrayed by Milton.

Speaking of the Age of Iron, Baudet, a contemporary popular writer on mythology, calls it "an epoch when impiety led to the eruption of all types of crimes"; and Ingres appears to agree with this in his notes and sketches for *The Age of Iron*. Here he will represent man's degeneration: the barbarians enter, the great civilization of the Greeks (that is to say, of Athens) collapses and the world is catapulted into the darkness that follows. For Ingres Greek culture is readily summarized: in his *Apotheosis of Homer* he portrays the outstanding writers; for Greek art he stresses Phidias and Ictinus; as to the music of these people, "We unfortunately know nothing," he laments. It is not surprising that when he speaks of the scene he is to represent, he describes a sort of Parthenon which will be destroyed. As the French artist Jules Laurens says when he recalls the drawings for the project: "One wondered, astonished, disconcerted especially by the complete absence of any personages, how all this might represent the presumed subject of the Age of Iron, rather than that, indeed, of an Age of Stone Construction. 'But you must understand really,' Ingres argued, 'to begin with, I established there, as a sort of prologue, all that background, in the middle of which I am going to introduce eventually the barbarians who will destroy everything.' "

The building in *The Age of Iron* is quite similar to its



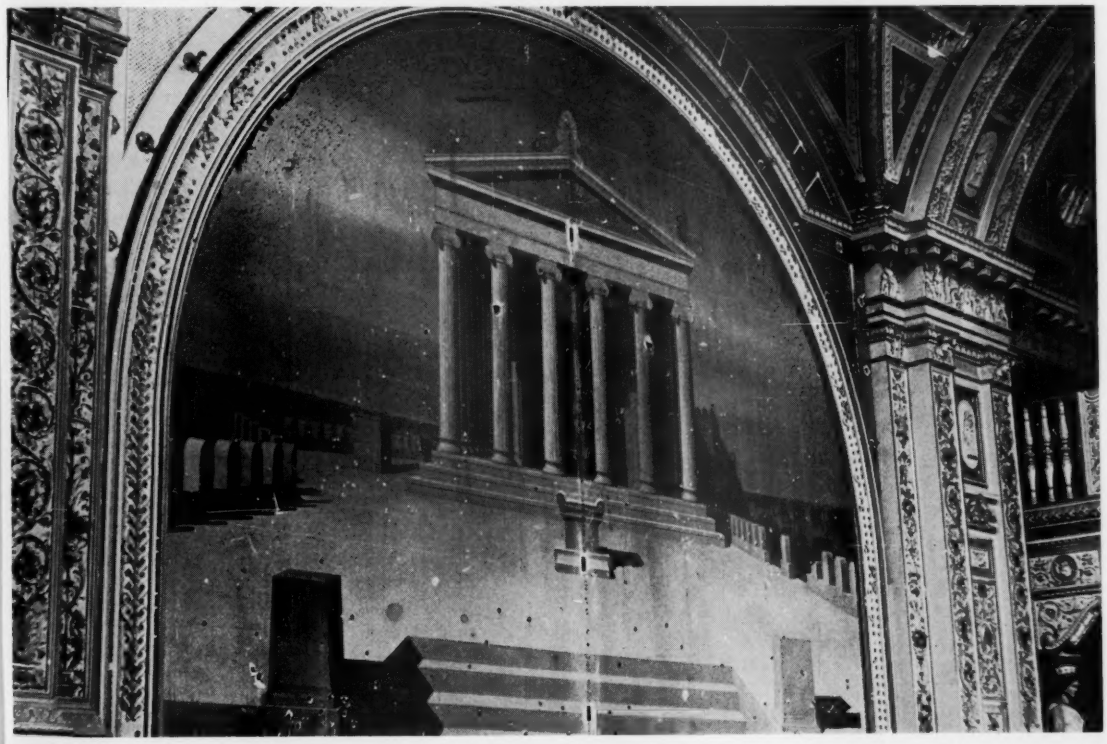
7. The Golden Age. The Fogg Museum of Art (G. W. Winthrop Collection), Harvard University.



9. Sketch for The Age of Iron. Musée Ingres, Montauban. Photo Jaubert.

prototype, the Erechtheum, except that it is peripteral and free-standing. Here is a façade with six Ionic columns resting on a stylobate of three steps; beyond, the proportions of the great door are kept, and one large acroterium is placed at the summit of the building. In the sketches for the project (Figure 9) Ingres' students, under the aegis of the master, have added sculptured decoration. In the final painted version Ingres has resorted to the simple and bleak look of the engraving (see Figure 6), with some decoration but no sculptured figures. The building is certainly on a hill, for we see smaller temples below it; the Athene Promachos appears in the drawings only. Crenelations are added as a frame —perhaps Ingres noticed them in engravings showing a later, fortified citadel.

What remains of *The Age of Iron?* The project was abandoned on the death of Madame Ingres in 1848, the contract canceled, the large mural boarded up. When brought to light again, after more than a century of concealment, there appeared the scene executed by Ingres and his two students: a sort of Parthenon-like temple standing on a low-walled Acropolis. The invaders and defenders have both disappeared, and only the loneliness of a remembered scene remains, perhaps a more fitting testimony to the desolation that the painter meant to describe—an empty scene which he dreamed of filling with his great drama. Beyond is the sky and a blue Aegean sea. In this last stage-set, on the stones of this lost Acropolis, we can only wonder at the persistence of the image and ask ourselves if, from the time he sat as a child in Aristides' house, Ingres ever for a moment left the unforgettable citadel.



8. The Age of Iron, mural by Ingres and students, at the Chateau de Dampierre.

BUILDING THE FORTRESS OF OLLANTAYTAMBO

BY J. OGDEN OUTWATER, JR.

IN STUDYING the construction techniques of the Inca, it is hard to envision a site where these are better revealed than at Ollantaytambo, an Inca town situated in the flood plain of the Vilcanota River in the Cuzco region of southern Peru. The site is amply terraced and much of the original terracing is still used for cultivation and river control. The street plan of the town is largely Inca, as are most of the buildings and the walls.

About one hundred feet above the town, on the spur of the mountain, stands an edifice often referred to as the "Fortress," which has been described by E. G. Squier (*Peru,* London 1877). In this building are to be seen some outstanding examples of Inca stone-cutting technique and engineering. There is considerable defensive and agricultural terracing on the site of the fortress. Fine stonework similar to that in the "Temple of the Sun" in Cuzco but perhaps excelling it in detail is also to be seen. But perhaps the most significant examples of Inca work are the great slabs and blocks of red porphyry that have been erected on the site. About twenty of these stones are in position, the longest being about eighteen feet in length and the heaviest weighing about forty-five tons. These and others are fitted both to the bedrock and to adjacent stones with the characteristic precision of the Inca stone-workers. The fit is absolutely precise and, in the case of the longest stone, it was made more difficult because the stone was placed near the edge of a cliff and on a surface that had not been smoothed for the purpose but deliberately left in its rough natural state.

Another unusual feature is the fact that the stones were brought from a mountain top about five miles distant and across the Vilcanota, which is by no means

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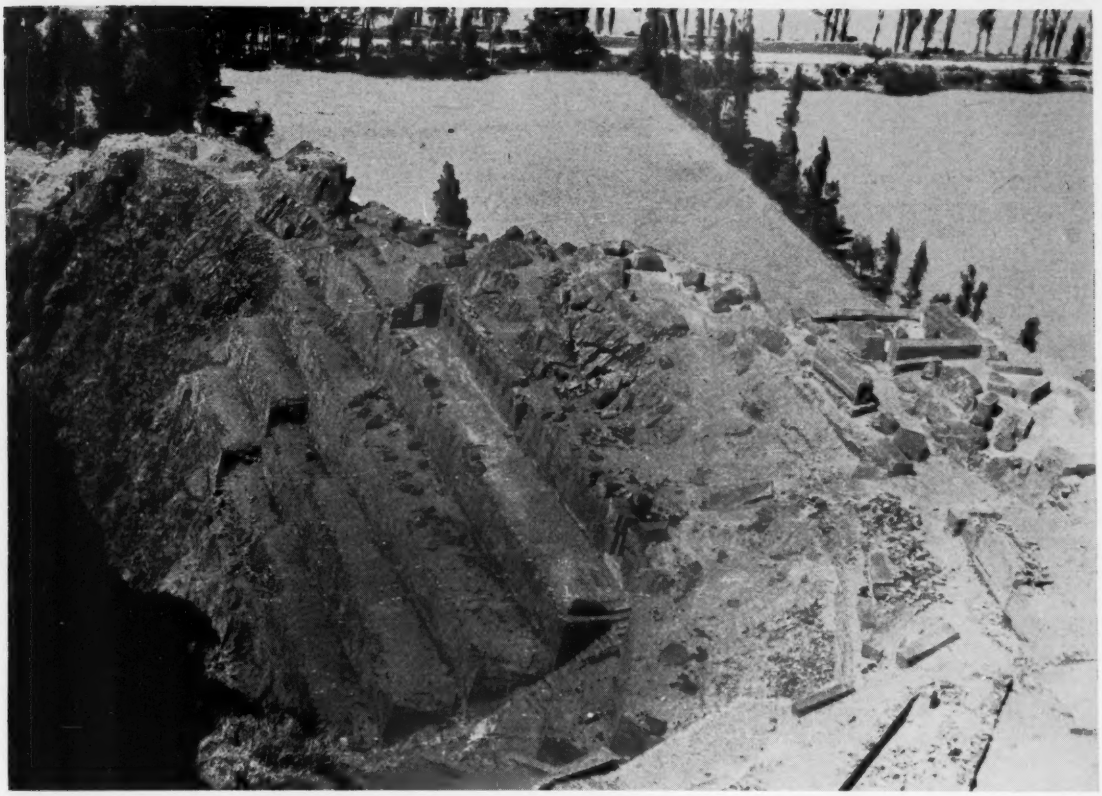
PROFESSOR OUTWATER is Chairman of the Department of Mechanical Engineering at the University of Vermont, and has led three expeditions under the auspices of the Wenner-Gren Foundation to investigate the engineering techniques of the early civilizations in the Western Hemisphere. This article comprises some of the results of the third expedition, made in 1957. The author wishes to acknowledge the generous support of the Wenner-Gren Foundation and to thank Mr. Chauncey C. Loomis and Mrs. J. Ogden Outwater, Jr., who were present on the field trip and who helped unstintingly.



A view of Ollantaytambo looking down on the main fortress area. This view shows the terracing as well as the larger stones where they now lie.

a small stream and is fordable only at a few points. They were then taken up to the site and placed in position. Thus there must have been a tremendous transportation problem as well as the usual erection problems. In order to understand the construction techniques used, it would be well to examine these three points: 1) the quarrying techniques, 2) the transportation of the stones, 3) the erection at the site. In all these operations, the limitations of physical equipment must be considered. It is highly unlikely that metal tools were used (I have seen very few examples of metal tools which have been blunted by use on stone); draft animals other than men were not available; as for the use of logs, alder trees were available which might have been thirty feet long and six inches in diameter. The present stands of eucalyptus are distinctly non-native and could not have been present during the Inca period.

One important feature of the site is that the construction appears to have been stopped suddenly, and stones in the process of being removed, cut or transported were apparently abandoned at exactly the point reached when the order to cease work was given. There seems to have been an even distribution of the heavy stones at the quarry, along the transportation route and at the fortress itself. This is a situation which is unlikely to occur at most sites.

THE QUARRIES for the larger stones used for the fortress lie below a monadnock, or mass of rock, which protrudes above a talus slope about 2000 feet above the river and about four miles due south of the fortress. The stones were not quarried in the usual sense of the word but were broken off from enormous talus slabs that had fallen from the cliff above. These massive slabs, approximately rectangular in shape, were generally broken into smaller pieces by the process of tapping the stone to form a continuous V-shaped notch all along a line parallel to a natural cleavage plane. In some instances there were wedge-shaped pockets in this continuous groove, about three inches long and two inches deep. These pockets may have been made to receive stone wedges, which would help split the rock and force it to cleave along the marked

Some of the larger stones in the fortress area that were abandoned on their working platforms.

OLLANTAYTAMBO CONTINUED

grooves. It is also possible that the larger pockets might have been used to allow water to seep into incipient cracks, so that on frigid nights freezing would be encouraged. This, in turn, would cause a widening and spreading of the crack until the split surface could readily be cleaved off.

All the blocks at this quarry site below the cliff bear evidence of chipping at the edges, and it appears that when a larger block was to be cleaved, a pile of stones was placed under it in such a way that the block would fall on them and the underside would be accessible. The blocks would then be worked further by a continuing process of grooving and splitting along a face at right angles to the initial surface of cleavage.

Very few tools are in evidence at the site. There were some hammer-stones of diorite but very few picks or wedges. This accords with the evidence in Mexico and in other quarries in Peru, such as that at Rumicolca, where I found two hammer-stones of quartzite which must have been brought to the site from a considerable distance, as there is no evidence of such material near the site. This implies that tools might have been made of valuable and unusual material, and therefore removed by the workers when the site was abandoned and taken to an area where activity was continuing. Such an area was found on the banks of the river near the town of Ollantaytambo itself, where great quantities of tools were lying abandoned by the workers.

It may be concluded from what has been said that the Inca went to considerable trouble to avoid the difficulties of orthodox quarrying and the undercutting which this implies. They found an area at a great and awkward distance from the site of construction at the fortress, with loose blocks that were in many instances over two hundred tons in weight, which they split down to manageable proportions by a long, slow process. They established a village of at least forty houses for the workmen near the site and undertook minor terracing in the area to supply their needs. The organization of the quarrying operation was elaborate for the limited quantity of stone available, and it bears out the inference that the quarrying operation itself was long and tedious. There were no short-cuts, and the shaping of a single stone might take many months of patient work.

IT IS IN THE MATTER of transportation that we can most admire the ingenuity of the Inca. At Ollantaytambo they had a tremendous problem in transporting large

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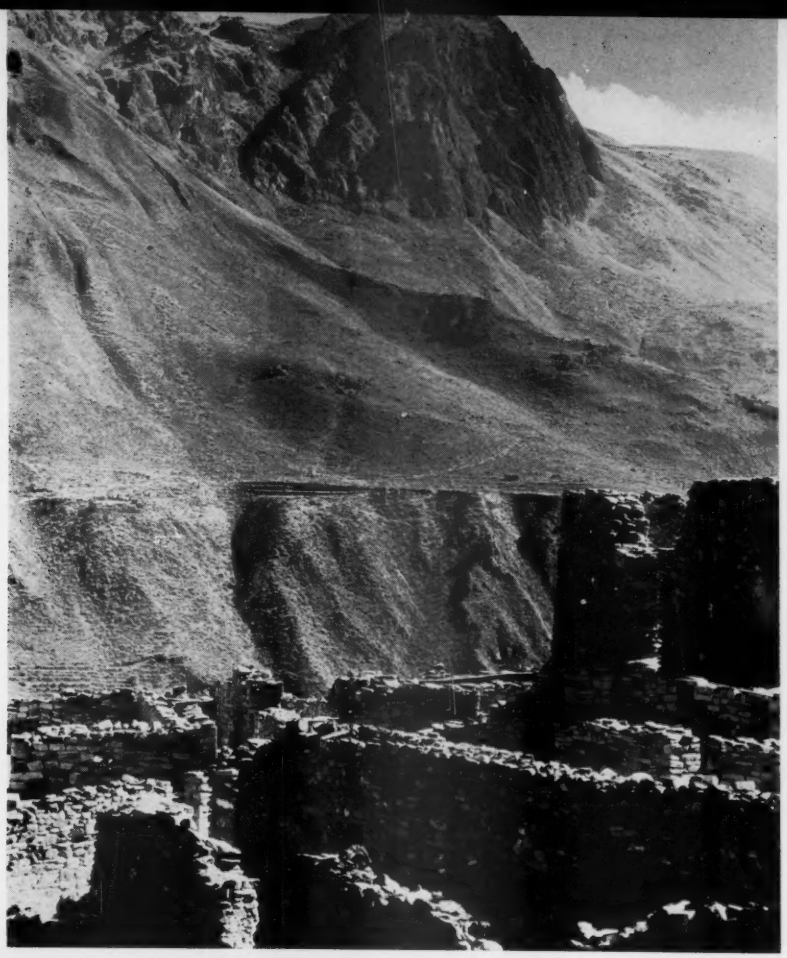


A view across the fortress to the far side of the valley, where the quarry area may be seen at the foot of a high stone escarpment.

Two large stone slabs at the quarry. They had been cleaved and were left on a pile of smaller stones ready to be hauled to the fortress.

A view of the Vilcanota valley showing two large stones which had been abandoned in the middle of the river at a fordable point. Also shown, in the background, is the long ramp used to haul the stones up a gentle incline toward the place where they were to be erected.

OLLANTAYTAMBO CONTINUED

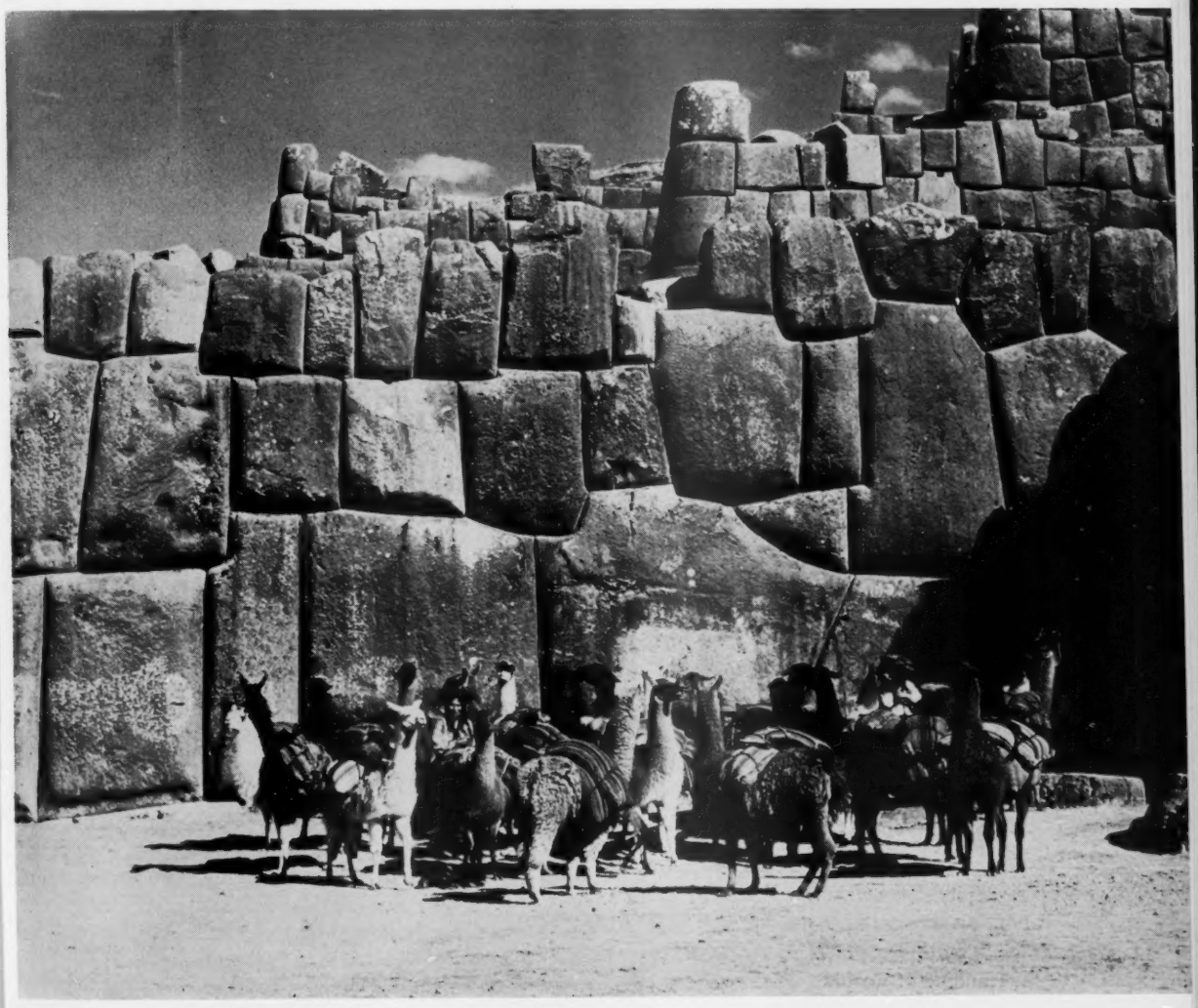
stones, the largest of which weighed about seventy-five tons, from a mountain top down to a valley, across a river and up to the fortress, and there to lay them exactly in position after cutting them to shape. Except for the last phase, the process is open to exact engineering deduction, as there appears to be only one solution to the movement of the larger stones that fits the available evidence.

The smaller stones were found only at the quarry and in an obvious group of about forty-five at the fortress. None were found along the route. This may well indicate that the smaller stones were carried relatively quickly; it seems reasonable to suppose, therefore, that they were transported in a litter made of logs which could be carried by not more than twenty men. The smaller stones could thus be taken rapidly and easily to the fortress; the journey would require about one day. The path taken—different from that used for the larger stones, so as not to interfere with the transportation of the latter—would have been along the river, leading to the ford just south of the town. At this point there is evidence of the working of these smaller stones, and from here a well built road winds up the east side of the fortress.

Larger stones—those over five tons in weight—were found spaced at regular intervals along a well defined path about fifteen feet wide, with a slope of about one in ten, that had been built from the quarry, in overlapping zigzags, down to a slide about five hundred feet in length, in which one large stone is still embedded. The slide ends at the ford; from this point the road crosses the river, which here is quite wide and shallow enough to be forded easily on foot. Indeed this place is still used as a ford. The road then goes on to the foot of a long ramp, built with the same gradient, which leads up to the fortress itself.

These enormous larger stones were certainly not carried. If we consider the largest stone found abandoned along the route, which measures 20 x 12 x 3½ feet and weighs about seventy-five tons, it is apparent that men could hardly walk alongside it, as it is only about three feet narrower than the road. But the even dispersion of the larger stones along the route suggests a much slower method of transportation, and the softness of the road demands a form of metaling to support their weight. There is no possibility of their having been dragged on sledges—the nature of the roads shows that they must have been moved on rollers on a prepared surface. This is suggested not only by the flat surface of the larger stones

The quality and the scale of Inca stone work is evident in this picture, taken at Sacsahuamán, another Inca fort in the Cuzco region.



but by the comparatively undisturbed condition of the soft road surface.

It is probable, then, that the stones were moved on rollers along a road metaled by placing groups of three or four logs lengthwise along its surface. The great distance from the quarry to the fortress precludes a permanent road-bed, as the number of trees involved would have been too great for the resources of the region. But it is easy to envision a track being laid along a path, a section at a time. The logs over which a stone had just passed would be picked up and placed in front of it to permit its continuous progress. The pressure on the road-bed, the force required to move the stones, and the size and number of the levers needed would by no means be excessive.

The river appears to be readily fordable at the point where the stones were brought across. The smaller stones could be carried on their litters and the larger ones manhandled across with ropes and rollers on a continuously metaled surface beneath the water. There would be little delay or difficulty, and no need to interrupt the flow or to alter the channel of the river. It should be pointed out that this method is relatively straightforward so long as the stone does not fall off the rails and become embedded in the earth or settle in the river bed. Whenever the Inca worked stone, they appear to have taken great care to keep it off the ground so that they could maneuver it with levers. One stone that had fallen off the ramp leading to the fortress and had embedded itself in the earth was abandoned and was being broken up into smaller pieces when the work was stopped, while several stones that had fallen off in the middle of the stream were abandoned on the spot. In other parts of the route it would have been relatively simple to recover the stones, lifting them by removing some stones from the road surface and inserting a lever.

The method described is simple engineering, and beyond reasonable doubt it was the method used.

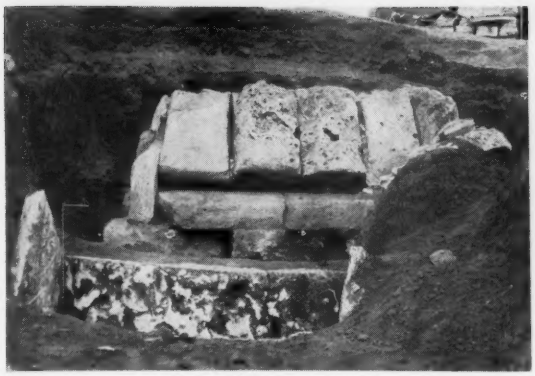
WHEN THE LARGER STONES were brought into the fortress, they were immediately installed on small platforms of stone and adobe, and it is apparent from their position that all faces of the stones were worked successively on these platforms.

The technique of working these stones so that they mate exactly with their neighbors has long been a matter of speculation. When one considers the bulk and mass of these large stones, one realizes that it was wholly out of the question to raise a stone once it had been placed in position. This leads to the inevitable conclusion that these large stones were shaped to their final form and installed just once. There was no possibility of adjusting the fit once a stone had been put into place.

The tolerances on these stones are fine beyond belief, and it is not only the edges that are mated but the entire surfaces. This leads me to suggest that the Inca stonecutters may have made casts of the cavity which was to be filled, and matched the shaped stones against a portable, positive master. The material used for casts is surely one that would remain rigid and take an excellent impression but vanish with time; perhaps adobe might have been used on a wooden armature, as there is a considerable quantity of mud around the fortress area that might have come from crumbled adobe.

The technique used to match the stones is distinctly percussive, though polishing and abrasion may have been used to beautify the finished stone. The larger stones were continuously pecked until they matched the master cast accurately, and then lowered into position from their working platform and given a quarter-turn in the process so that they bedded exactly. The platform would have been located just above the final resting-place of the stone, which would have been manhandled into position by ropes hooked around the two knobs that always appear to have been left on the lower portion of the face of the stone, and that were removed after the stone was in position. It is also possible that the stones were slid into place from a ramp or platform, and that the knobs were for levers rather than ropes or pulleys. In no case would it be necessary to do the impossible task of raising the stone once it had been lowered. The technique suggested here seems to be feasible, and every detail that is needed appears to exist at the site of Ollantaytambo.

This is a brief description, backed by engineering evidence, of the extraordinarily skilled techniques used by the Inca to achieve their unsurpassed structures. They were not only masters of materials but masters of engineering. Their ingenuity surely places them among the greatest builders of all time.



The chamber tomb recently found at Paestum, side view.

The arch-shaped entrance of the chamber tomb.

A NEW PAINTED TOMB AT PAESTUM

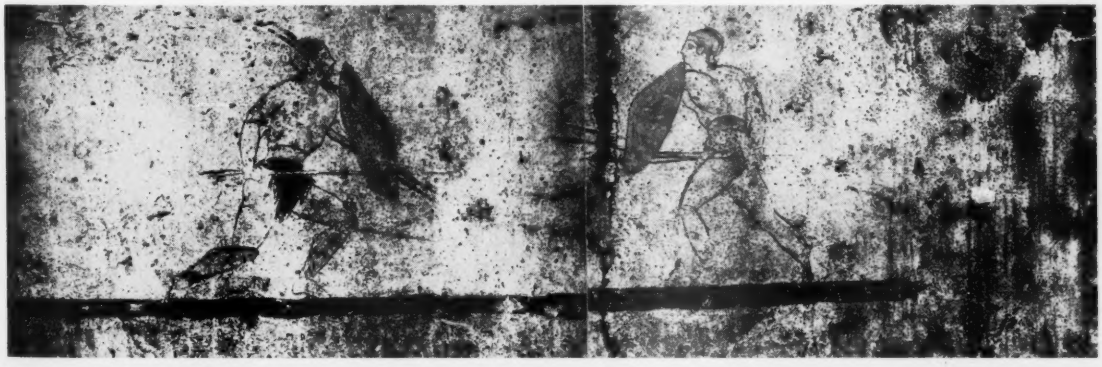
By PELLEGRINO CLAUDIO SESTIERI

Superintendent of Antiquities, Salerno

ON THE NINTH OF SEPTEMBER, 1943, American troops made their historic landing at Salerno. They established a beachhead and their engineers turned immediately to the vital task of constructing airbases. As luck would have it, one of the sites chosen was a farm at Gaudo, a little over a half-mile north of Paestum. The bulldozers went to work—and within a matter of days their blades ripped into the remains of an ancient cemetery.

It was not until a year and a half later that archaeologists were able to get at the site. Even then, in the spring of 1945, they had to work amid the constant roar of fighter planes taking off for their grim missions from the airstrip nearby. What they found was worth the effort—the burial ground of a people who, in the third millennium B.C., had migrated from their homes in Asia Minor and settled on the rich fields about Paestum. In the graves, which had been hewn with flint tools in the underlying soft limestone, were found skeletons in contracted position, large pottery vessels, and beautifully made flint daggers and arrowheads. All these were evidence of a culture unique in Italy of this period, which is now known as the Gaudo culture.

Then recently came an exciting new find: a splendid Lucanian tomb datable to the fourth century B.C., in



Fresco painting on the south wall of the tomb: two gladiators ready for the fray.

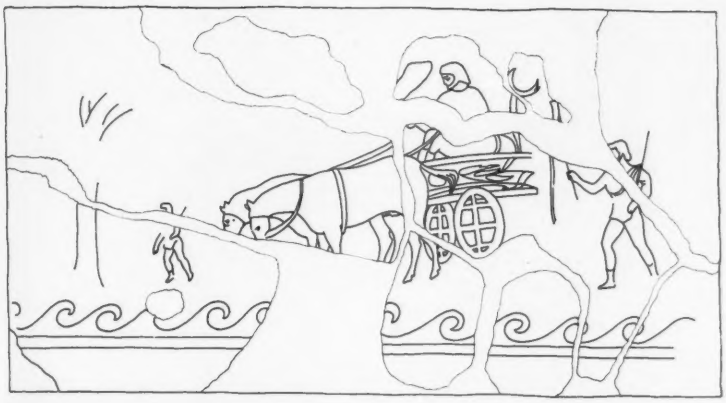
Fresco painting on the north wall of the tomb. The deceased riding his chariot to the underworld, preceded by a warrior with two spears.

Right: Drawing of the fresco on the north wall.

practically perfect condition. Again it was a modern machine that was responsible. When the war ended, the airbase was abandoned and the land it once covered returned to the farmers. Their tractors, now turning the soil in the interests of peace, not war, broke into a large hole. Scientific excavation followed. The result was the uncovering of one of the most sumptuous and grandiose South Italian tombs yet known. It recalled a number of rich Lucanian tombs which were discovered early in the nineteenth century. Their description survives in *Antichità Pestane* (1819), by Canon Bamonte. Unfortunately, after the contents had been removed, the tombs themselves were left to the depredations of the peasants and the mercies of the weather.

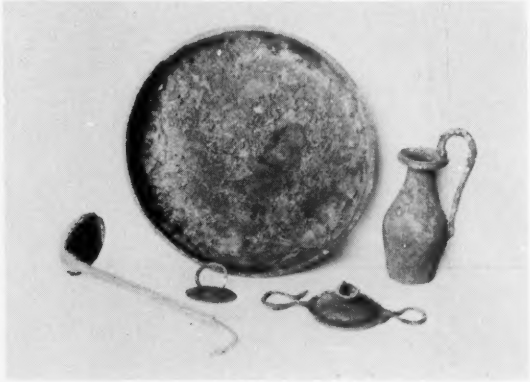
IN SHAPE AND CONSTRUCTION the newly found tomb is unique. Most of the other tombs of this period that have been discovered in the area are simple affairs, limestone slabs set up to form a sort of chest. This is a real chamber tomb, a structure of square blocks forming a rectangular room about nine feet long and six and three-quarters wide. Its roof is of large flat slabs set into grooves in the side walls and meeting to form a gable. The east end was closed by two large slabs set upright. When these were removed an entrance made in a most interesting shape was revealed. It consists of two small piers, one on either side, topped by a large lintel out of which a semicircular piece had been cut to give it the shape of an arch. Although this is not a true arch, it is nevertheless of the greatest importance and interest, since the tomb dates from the early fourth century B.C.

Three of the interior walls of the tomb had been painted in fresco. The technique used was the same as that found elsewhere in Paestum: on a white ground figures were outlined in black, and details added in yellow or red. Though the subjects are the same as those in other tombs at Paestum, they are executed with greater simplicity and taste, and the backgrounds contain only a few pomegranates, symbols of resurrection, instead of the usual crowded mélange of motifs. The painting on the south wall is the best preserved—two gladiators preparing to lock in combat. Only half of what was originally painted on the west wall is left. The hind part of a horse is shown; judging by examples found in other tombs, the complete scene very likely showed a cavalryman returning victorious from battle. The space available makes it likely that he was shown alone and not accompanied by trophy-bearers or greeted by a wife, as elsewhere. On the north wall is a scene frequently found in the Paestan tombs, the deceased on his way to the underworld. He rides a chariot drawn by two horses—mules are



Detail from the same painting on the north wall, showing the horses with lowered heads, the warrior in front, leading them, and above, at left, a pomegranate.

Lekythos with a scene from Aeschylus' *Eumenides*. Orestes sits on an altar surrounded by trees. His mantle covers only his back; in his right hand is a sword; his left holds the sheath. Apollo stands before him with a laurel branch over his left shoulder and a piglet (for sacrifice) in his right hand. Behind the god is Latona, wearing peplos, mantle and crown. The name of each figure is inscribed in Greek letters. Height 18½ inches.



Bronze vases and implements found in the tomb: a large basin, a ladle, strainer (in two parts) and jug.

Bronze armor found in the tomb—helmet, breast and back plates, greaves.

Kylix with polychrome figures. A woman sits on a yellow throne. Her flesh is painted white and she wears a black himation. Behind her is a female figure, perhaps Peitho, and before her is Eros. Very likely the wife of the deceased —identified with Aphrodite—is represented here in idealized form, as she prepares for her marriage to Hades, god of the underworld. Diameter 10½ inches. *Right:* Plate with painted fishes and marine creatures.

sometimes shown elsewhere—whose heads droop low as they make the sorrowful and arduous journey. A man carrying two spears leads them—a comrade-in-arms perhaps, accompanying his friend or his chief on this somber last march. Perhaps, as in other tombs, the original scene included behind the figures a demon with a whip, the divinity whose task it is to drive the dead from their homes. Above the three scenes runs a cornice in relief bearing a painted laurel branch; under them is a socle painted in red.

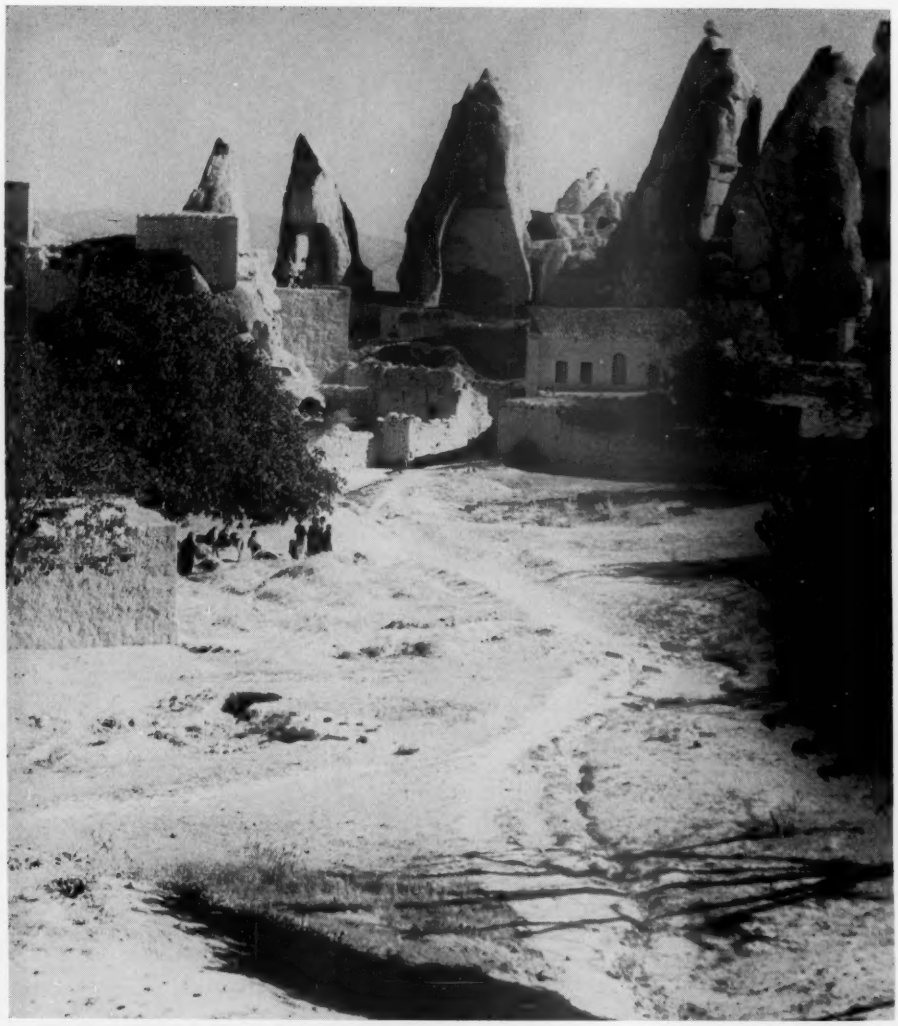
THE BODY of the deceased had been laid out on the earth floor, head toward the east. Near his feet had been placed his bronze armor: breastplate and backplate, each fitted to the torso, greaves for protecting the legs, and a helmet of Italic type with two sockets to hold the plumes. Nearby were his weapons, a sword and spear, both of iron, and also a candelabrum and a whip. The utensils found in the tomb were of both bronze and clay. The bronzes include a small jug (much like those found in fifth-century tombs at Vulci), a circular basin, ladle and strainer, the latter two similar to fifth-century types found in Etruscan tombs. The ceramic objects include a number of cups, an undecorated amphora and three important painted vases with well executed and highly interesting scenes. One particularly notable vase is a large lekythos bearing scenes from Aeschylus' *Eumenides*. The painting is probably the work of Asteas, Paestum's greatest vase painter in the fourth century B.C. The second vessel is a large, two-handled cup (kylix) with polychrome figures. The central figure, a seated woman, probably represents the warrior's wife, who is identified with the goddess Aphrodite and at the same time imagined as the bride of Hades. This vase is also attributed to the painter Asteas. The third vessel is a plate charmingly decorated with fishes, a squid and other sea creatures. Although of Paestan origin, it shows Campanian influence.

The bronzes and the paintings on the walls of the tomb are to be dated in the early years of the fourth century B.C., while the vase paintings appear to date from ca. 340. This slight discrepancy in date, as well as the fact that the weapons and armor were found at the west end of the tomb, leads us to believe that the warrior was interred first, early in the century, and the tomb was later re-opened and the offerings adjusted to make room for his wife.

The wall paintings, although Lucanian in subject-matter, are Greek in technique and style, and certainly were done by a Greek painter. The *Eumenides* lekythos records the work of an Athenian dramatist. We can see that although Paestum had been conquered by the Lucanians, its character and sentiments remained always Greek.

BYZANTINE MILITARY STANDARDS IN A CAPPADOCIAN CHURCH

By DOROTHY WOOD



View showing cones used as houses and storerooms. Photograph courtesy of Herman Kreider.

IN CENTRAL TURKEY, southwest of Kayseri (Caesarea in ancient Cappadocia) and south of the Kizil Irmak (Halys River), are the remains of a plain formed of volcanic material which erupted when Mount Argaeus was active. In many parts this has been cut up by the action of wind and water, and carved by these natural forces into a great number of fantastic cones—sometimes one, sometimes hundreds together. This soft rock can be hollowed out easily to make homes and storehouses which are warm in winter and cool in summer. Such "cave dwellings" have long been characteristic of the region.

Life in this region is often hard and near the subsistence level. Grapes and other fruit are the chief cash crops, while animal products are in short supply. Peace on the roads is essential if the fruit is to be marketed and a tolerable standard of living attained.

In the Byzantine period, the caves and cones were the homes of a great number of monks and hermits who liked to settle in surroundings of natural beauty, far from the great towns. The fruit would be welcome in the monks' meatless diet, and they could make their own wine. As they had to work hard and live a simple life, had no families to support, and were often specially favored in taxation, they could maintain their monasteries in such surroundings. They would never be rich enough to rival the great city monasteries in magnificence or in learning; neither would they be subject to the same temptations of luxury.

A great number of their churches, chapels and monastic buildings remain. As they were excavated in the rock, they have been preserved except when they have been adapted to other uses, or when the rock itself has crumbled. The rare dated inscriptions, as well as a comparative study of the styles of architecture and wall paintings, enabled Father de Jerphanion to build a chronological framework for them (*Les églises rupestres de Cappadoce*, Paris, 1927-1942).

Many chapels were given a rough folk decoration, usually done in red ocher. This was often applied directly to the rock and was a finishing touch to the work of those who hollowed out the chambers, like the dots and lines and zigzags with which the peasant craftsman still decorates winnowing forks, threshing sleds or planting sticks before offering them for sale. The chapel decoration is usually roughly executed and looks as though a small child had dipped a finger in paint and scrawled on the wall. Sometimes, however, the walls were more carefully prepared and the designs more regular. The most common patterns are geometric: zigzags, criss-crossings, interlacing circles or semicircles, and checkerboard designs. They accentuate the main lines of the architecture; the walls are consecrated by an occasional cross.

The eroded volcanic plain of the district of Göreme. This picture was taken in the spring.

The entrance to Karanlık Kilise, one of the "column churches" excavated in the soft rock.

This kind of decoration was often only temporary; in prosperous times it was covered by sacred figures and scenes painted on plaster. Sometimes, however, the folk decoration was more ambitious, covering much of the building, and this was probably intended to be permanent. Birds, plants and animals were depicted, but not with any attempt at realism. Human figures are so rare as to be quite atypical. A rich variety of crosses is often the chief decorative element. It can be guessed that this fuller folk decoration flourished in times when lack of security in the countryside brought poverty and with it a preponderance of peasant monks over those of more distant, city origin.

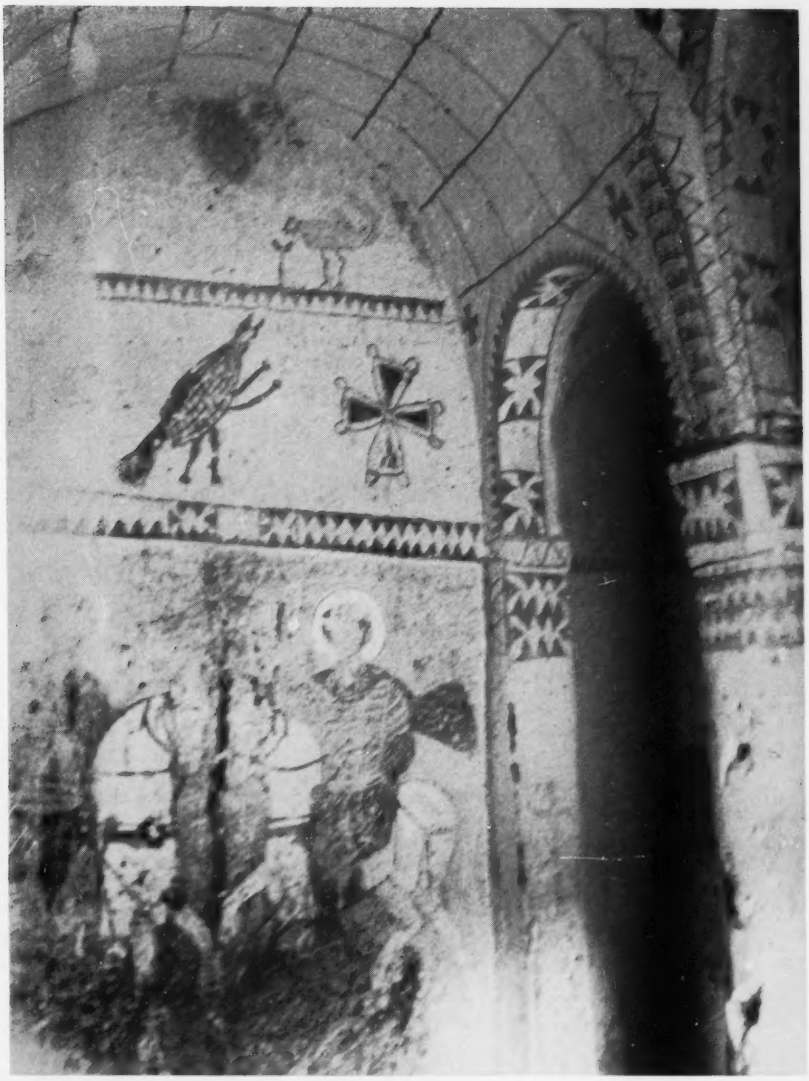
The folk decoration can be dated only with reference to the building in which it appears, for, as it lacks artistic merit, it has not been studied. It is, nevertheless, valuable in showing the persistence of prehistoric elements of decoration in the countryside. In addition, it is important as evidence that the Anatolian peasant monks usually avoided the representation of sacred personages, whether the government of the time permitted it or not, and it shows what forms of expression were more natural to them. In certain chapels the folk decoration may have an additional interest. One of these is St. Barbara.

GÖREME (KORAMA), one of the monastic centers in the Cappadocian "Cone District," is now accessible to visitors. Here there are three churches of orthodox Byzantine type, with four columns supporting a dome, which have wall paintings dated by style to the middle of the eleventh century. Behind one of these (Elmalı Kilise), and cut into the same rock, is the chapel of St. Barbara, which resembles the column churches in architectural style except that it is much more roughly executed and therefore is probably later in date. It resembles them in having an earlier folk decoration of the geometric type, carefully executed with compasses in a well blended light red paint. However, instead of paintings on plaster, it has another, later, folk decoration, done in a red hårsher than that of the earlier decoration and a very pale pink; this covers the cupolas, apses and upper walls, and is very crude compared with the first, both in execution and in the quality of the colors employed.

It is probable that when the chapel was first hollowed out, a complete fresco decoration was intended, but something occurred to prevent it and to cause such deterioration in conditions that the second folk decoration was substituted.

What that something could be is clear. In the 1050's and 60's the Seljuk Turks were conquering Armenia and raiding Byzantine territory. In 1059 they invaded Cappadocia, and in 1067 Caesarea itself was devastated by a marauding band. In 1069 the Byzantine Emperor Romanus IV Diogenes cleared the land of raiders, but in

THE AUTHOR, educated at Somerville College, Oxford, has taught for five years in England and eighteen years in schools in Istanbul, Turkey. At present she is living in Anatolia and teaching privately, while studying the Byzantine churches in the region of Ürgüp, in the "Cone District." This article is the first of several which she plans to publish as the result of her research in this little known area.



St. Barbara's, the bay opposite the entrance, showing the second folk decoration; the vault is painted to imitate masonry with a symbol in the center to ward off the evil eye. Under that were probably two birds drinking at a fountain, but one has disappeared. Below the remaining bird is a peacock worshiping the cross. Under the folk decoration is a painted panel showing Sts. Theodore and George, probably of the twelfth century. A rectangular standard appears on the wall through the arch. Photograph courtesy of Gunda Holzmeister.

Fresco painting in Karanlık Kilise. The architecture is earlier than that of St. Barbara's. One pillar has gone, without weakening the structure, as the pillars were not necessary as supports in churches excavated in the rock. Photograph courtesy of Herman Kreider.

BYZANTINE STANDARDS continued

1071 he was defeated and captured at Manzikert, in the east, and his army was destroyed. To his conqueror, the Seljuk Sultan, he ceded the eastern part of the empire, including Caesarea and the cave church district. There followed long struggles between Seljuk leaders, and between Seljuks and Christians, so that for some decades authority was shifting, disorder was common, and prosperity vanished from the countryside. Under these circumstances, if dangerous journeys had to be undertaken, they would be for more essential things than paint and plaster, and both painters and patrons would avoid the unsettled country districts. During these years, when the hope of obtaining frescoes for the Chapel of St. Barbara had withered with the passage of time, the second folk decoration must have been painted by local people, with peasant clumsiness, for peasant eyes.

It is this second folk decoration that gives St. Barbara its special interest, for although it includes such symbols as appear in the illustration on page 41, it consists mainly of military standards and scepters. These had no place in the usual painted decoration of Byzantine churches, but the folk art was independent of this. Standards and scepters appear also at Firkatan Bagh Deresi, in a chapel probably of the eighth century. These are mostly of the eagle-bearing type, which does not appear in St. Barbara.

What might be the reason for choosing this subject?

In the old days standards were of great practical importance in marshaling and controlling the movements of armies. As emblems of the legions they had the emotional significance of the old Roman eagles, the regimental flag of modern times, or the military mascot. When the Byzantine army was effectively defending the empire against non-Christian enemies, the importance of the standards as Christian symbols was intensified. Those of the emperor and the palace regiments were kept as sacred relics in a church in the palace at Byzantium. They were brought out for the most important palace ceremonies, and to accompany the emperor or his representative when he left the city to command the army. Military standards were therefore suitable subjects for the decoration of churches, where the army's success must have been prayed for. Their use may be compared with the display of regimental flags in modern churches.

Among the monks at St. Barbara would be former soldiers familiar with the standards. They may have been then, as banners in Eastern churches are today, symbols of the fight against the powers of evil. The monks were now undertaking this fight by means of prayer and fasting in place of their former physical struggle against human enemies.

In the second half of the eleventh century, the first occasion of victory for the imperial armies would be the very short period of Romanus IV's successes, and this cannot be entirely ruled out as the period of the decoration. However, if a reasonable interval after the first folk decoration is allowed for changes and deterioration, the most likely time seems to be the reign of Alexius Comnenus (1081-1118). Seizing the throne when the empire seemed to be in complete collapse, Alexius founded a new dynasty and regained some of the lost empire in spite of enemies on all sides, heathen, Moslem and Christian. His success was due to his skill, cunning and inventiveness in administration, diplomacy and warfare, as well as to the new army he formed and trained, which became a real champion of the Cross.

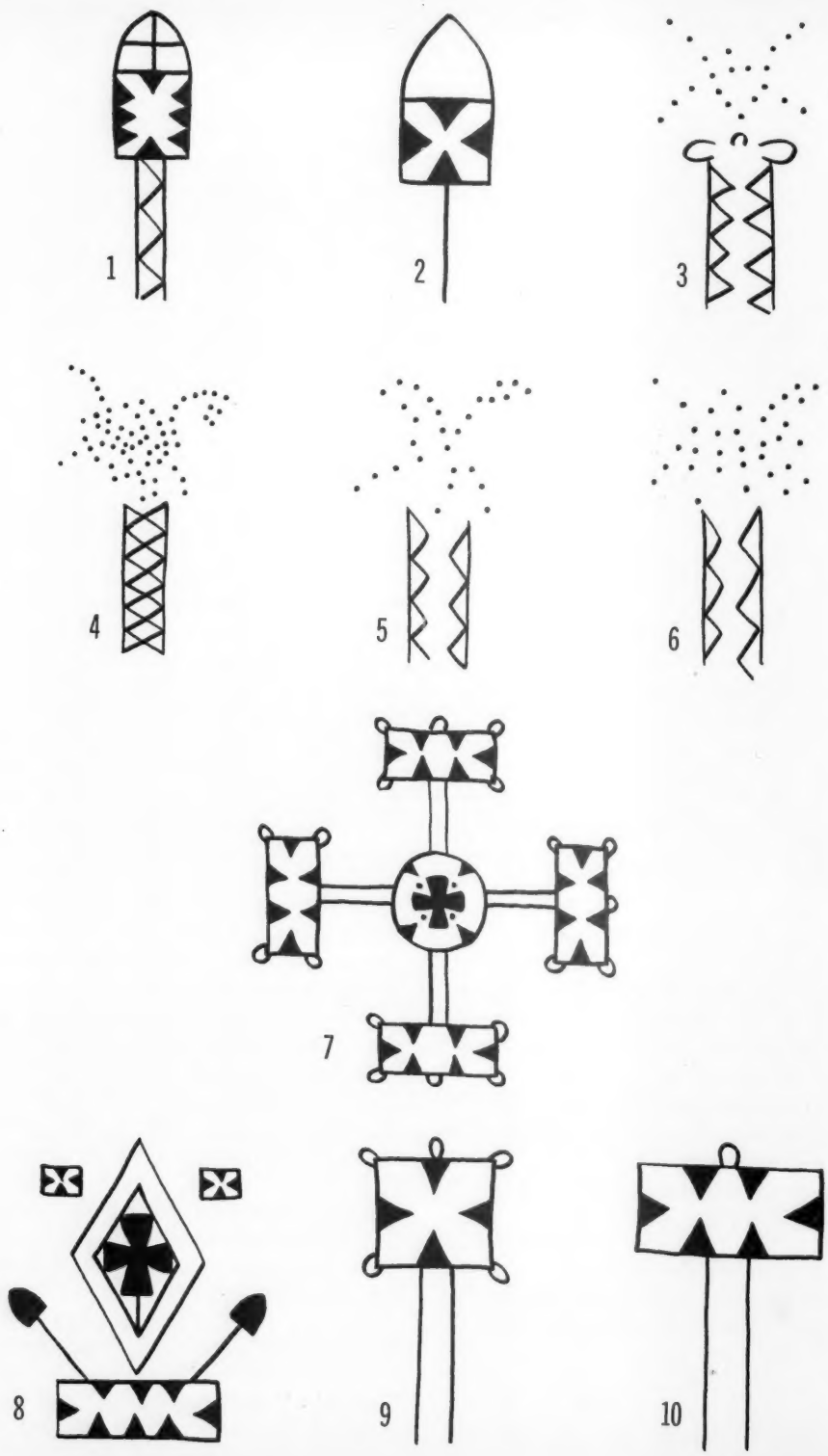
Although the cave church district remained under the Seljuks, there were periods when Alexius was in alliance with them, and the chief enemies were the heathen Petchenegs and Comans. Even if the standards were painted at a time when they might be interpreted by the rulers as evidence of disloyalty, the Seljuks had not the administrative machinery to control the artistic activities of monks in remote areas or the desire to do so unless public order was likely to be upset. This area, with its many monasteries, must have been more actively Christian than many country districts in Anatolia, and the painted churches visible evidence of the Byzantine heritage. It would be natural for the monks to rejoice in the victories of Alexius and perhaps hope for reunion with the empire. When, in alliance with the Crusaders, the Byzantines marched through Cappadocia on the way to the Holy Land, such hopes may have risen high, though they were to come to nothing.

Since it is possible that the standards painted in St. Barbara represent those in use during the reign of Alexius, it may be worth while to refer to some passages in the *Alexiad* where standards are mentioned. (The *Alexiad* is the history of the life and reign of Alexius, written after his death by his daughter, Anna Comnena.) Alexius' use of standards illustrates in miniature some of the qualities that led to his success.

THE VARIATIONS in the painted standards in the chapel of St. Barbara are so many, both in shape and in detail, that in the few instances where two seem identical it appears that they must have been differentiated by color. The support is sometimes a single line, probably intended to represent a metal rod; sometimes it is thicker and has zigzags or other designs, presumably representing a decorated wooden pole. The standards appear to be allotted to the various parts of the church in order of dignity: first, the cupolas, next, the apses, and, finally, the upper parts of the walls and arches. No standards appear on the lower parts of the walls.

In the central cupola are eight standards in pairs, each pair differentiated by detail in the upper part, which is in the shape of an inverted shield (page 44, No. 1). Below this on each standard is a long rectangle, larger than those that occasionally appear on other standards. These rectangles may represent the purple banners, related to the "scepters called *vela*," mentioned in the tenth-century description of the palace ceremonies by the Emperor Constantine Porphyrogenitus.

In the eastern cupola, alternating with shield-shaped standards (No. 2) having smaller "banners" than those of No. 1, are four wooden poles (Nos. 3-6) with dotted designs above—apparently floating unsupported in the air—representing animals and birds in schematic form. These must be associated with the standards and it seems likely that they are intended to represent scepters. The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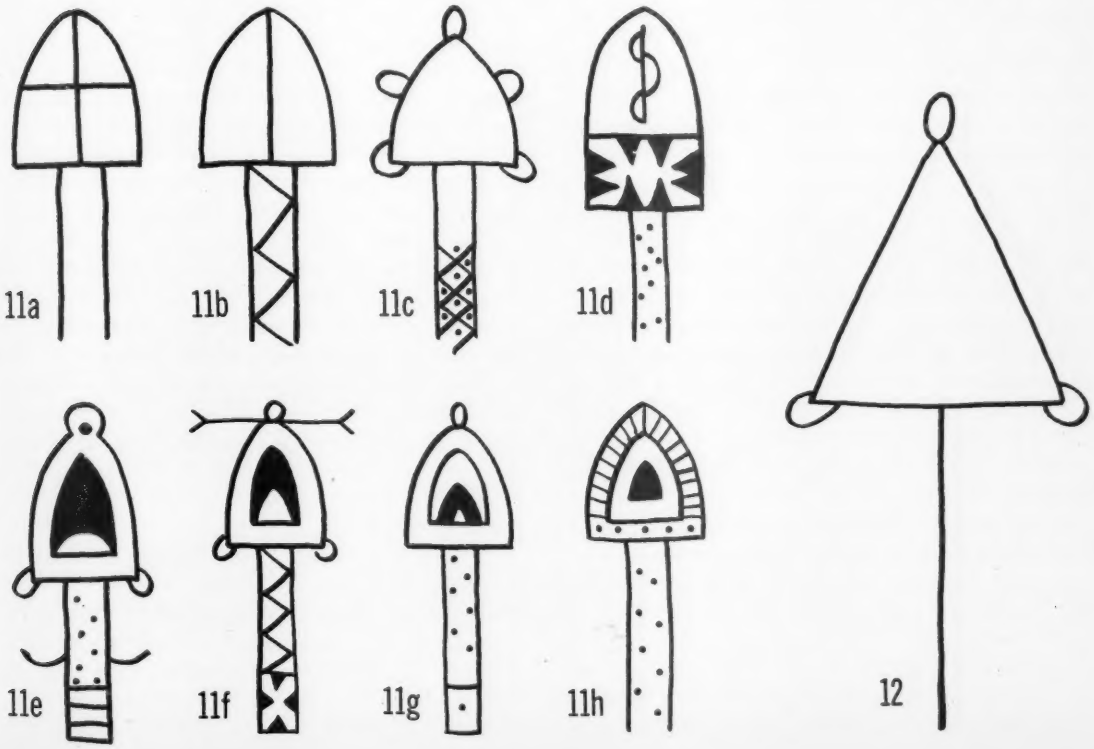
military scepters are believed to have been a survival of the ancient Roman ensigns, and in the tenth century to have carried representations, possibly still of the eagle, among other emblems. In Constantinople they were carried in solemn procession to St. Sophia, with the other standards and the crosses, and set out in the correct order. Even if the old eagles remained in use in the earlier part of the eleventh century, most of them must have been lost to the enemy in the many disasters and defeats between the coming of the Seljuks and the accession of Alexius. A large part must have been lost in the battle of Manzikert.

It is doubtful whether at that time there could be found, even in the capital, craftsmen capable of casting in the round figures of the size of the old eagles. When the army was reestablished, something new would have been necessary. In the *Alexiad* it is mentioned that the part of the army commanded by Alexius had special equipment: horses with housings of imperial purple, and imperial standards. There is a single mention of silver-studded lances. These may have been temporary, as, later, silver-studded scepters are mentioned instead. If these silver studs were arranged in a design on a frame so as to catch the light they might have appeared like the dotted objects painted in the eastern cupola of St. Barbara's. Their construction would be comparatively simple, and they would provide animal emblems to carry on the Roman tradition in a new form. The references make it clear that normally the scepters left the palace only when the emperor was commanding the army, and that their appearance implied his presence.

If these two groups are scepters, their placing in the cupolas would be due to their descent from the Roman standards. It might be expected that the cross and the labarum would have the first place, but in the *Ceremonies* the scepters and scepters with banners *(vela)* are mentioned before the crosses and labara. In the chapel at Firkatan Bagh Deresi, however, the cross takes first place; in the eighth century the emperors were attempting to refound the state on a more Christian basis, so



this position would be natural. But in the ninth century many of their innovations were abandoned, and there was a return to older traditions, as seems to have happened here in the precedence of the scepters.

Alexius' use of the scepters is illustrated by an incident which took place in 1086. He was then too ill to lead the army in person, but he sent his best troops with imperial standards and silver-studded scepters to help the Seljuk 'Abd al-Qasim, who was being besieged in Nicaea by a rival Seljuk ruler, Barsak (*Alexiad* v. 7). The allied Turks admitted them to the Fort of St. George, in the neighborhood of Nicaea, where they concentrated the standards and scepters over the east gate, facing the enemy, and kept up incessant war cries and shouting. Convinced that the emperor had arrived with a large army, the besiegers raised the siege without further fighting.

Again in 1097 Alexius found the scepters useful. At that time he and the Crusaders were besieging the Seljuks in Nicaea, but Alexius was afraid that if the Crusaders shared in the capture they would not yield the city to him as they had agreed. Therefore he arranged secretly with the Turks (who preferred him to the Crusaders) to surrender the city to his own general after a mock attack. The Crusaders were then unexpectedly confronted with the imperial scepters and standards on the ramparts and heard the horns and trumpets proclaiming the "victory" of the Byzantine forces.

In the apses appear square or rectangular standards (Nos. 7-10), like the labara the emperor is often shown holding. Some are arranged at the end of spokes, radiating in cross form from a cross in a circle (No. 7). Some appear with the cross on the screens of the sanctuary—on one screen in a cross-in-diamond, another form of the labarum (No. 8). This type was, of course, newer than the Roman.

These first three groups must be the "imperial standards and scepters" of the crack cavalry. They could be easily distinguished at a distance from each other and from the other types.

By far the most numerous type appears on the upper walls and tympana. This group is of the inverted shield form (No. 11); they appear often in groups of three; the centered one with a metal pole, the flanking ones with wooden poles. These are varied in detail, and it cannot have been difficult for the soldier to distinguish his own, but at a distance they must have been harder to distinguish from each other except by color. These may have been the standards of infantry troops, divided into groups of three, as opposed to the cavalry, divided into groups of four.

The group of three similar triangular standards (No. 12) in the west tympanum could be a variation of No. 11, or a further subdivision of the company into three; or these could be the standards of federated troops.

These last two groups would be the standards under which the common soldier served. To train these soldiers, who were at first few, inexperienced and uncoordinated, Alexius often had them march in order of battle, each marshaled under his standard in his exact place. He continued this training until, on his last campaign in 1116, the army marched against Iconium (Konya) to the sound of the flute, so that it moved like a single man and could be halted or restarted in a moment at the sound of a trumpet. Anna Comnena's lyrical description of this march suggests that marching in step was an innovation, and that this intensive drilling of the troops was one cause of Alexius' success.

LATER than the standards and scepters, and sometimes superimposed on them, are a few painted panels (see illustration on page 41), including one of St. Barbara, from which Father de Jerphanion named the chapel. These represent the gradual return of order and prosperity as the Seljuk empire of Rum became stabilized, with its capital at Konya. These isolated panels are not all of the same date, and since they are often difficult to date closely, the presence of the folk decoration of standards and scepters in St. Barbara's is useful in narrowing the possible limits within which they could fall. The standards also throw light on provincial psychology, as well as showing the forms in use at the end of the eleventh and the beginning of the twelfth century.

While they are now remote from us in place and time, they were not so to some of our ancestors. When the English found it hopeless to fight any longer against the Normans who had occupied their country, many left to fight for Byzantium against the Normans of Sicily. Both groups of Normans came with Crusaders from all parts of Western Europe on the First Crusade, at the end of the eleventh century, and fought in association with Alexius' army—doubtless to the dismay of many of the English. To these the originals of the standards in St. Barbara's must have been as familiar a sight as to the soldiers who had marched under them before becoming monks in Cappadocia.

ANCIENT GLASSMAKING TECHNIQUES

The Molding Process

By FREDERIC SCHULER

THE ARCHAEOLOGIST has been handicapped in his study of glassmaking by the lack of excavations of workshops, of representations of the process in art, and of literary records describing the steps used. Not until the time of the peripatetic Greek monk, Theophilus, who probably lived in the tenth or eleventh century and wrote "An Essay Upon Various Arts," are we given the first adequate description of glassmaking, and by then the earliest techniques had been long forgotten. However, modern glasses have the same physical properties as ancient glasses, so that if one knows something about these properties and about glassmaking as it is practiced on a small scale today, excluding machine operations, one can speculate intelligently about the fabrication of glass in the past.

When one goes to a small factory and watches glassmakers at work, it is impossible not to be fascinated. The few simple tools, the apparent ease of manipulation and the nonchalant attitude of the workers in the blowing technique seem to make us feel that we could do these things, too, except for the suspicion that the skill may be greater than we realize and almost at a subconscious, automatic level. Closer examination of an attempt at making a "gather" of glass shows that there is a whole sequence of operations requiring skill and coordination. Thus, this apparently simple method is quite sophisticated. Earlier methods must have been less so, although undoubtedly more time-consuming and involving many more steps.

Glass in its molten form behaves much like any other liquid. Its fluidity varies with composition and with melting temperature; at high temperatures its fluidity can be compared roughly with that of motor oil. Glass differs from other materials in its ability to preserve its liquid characteristics, failing to have a sharp freezing point and to become suddenly rigid when cooled, as do other materials. Yet upon further cooling glass does become rigid and has solid properties. Thus it must have been immediately obvious to an ancient craftsman that at room temperature it can be ground and polished; at high temperatures its unique fluid properties permit a variety of manufacturing techniques which have had a long evolution.

A glass is not a chemical compound, but rather a mixture of oxides. In brief, in order to make glass, whether in modern or ancient times, certain materials are fused together, which in the heating process give off various volatile gases. The fused material remaining consists of various oxides, with the largest proportion the "glass-former," or silica, which comes from the sand used, and smaller proportions of "fluxes," or alkalis, which make the mass more easily fused than sand alone, and "stabilizers," like lime, which make the glass durable and resistant to water. Ancient glasses are actually very complex in composition, but their complexity is accidental, owing to the use of impure materials, crude sand and plant ash, while the complexity of modern glass is due to the deliberate introduction of a variety of pure materials made possible by scientific development.

In spite of variations in composition, ancient glasses are all alike in that they become less fluid as the temperature is lowered. Therefore the dependence of flow, sagging, distortion, fusion, etc., on time and temperature is approximately the same as with certain selected mod-

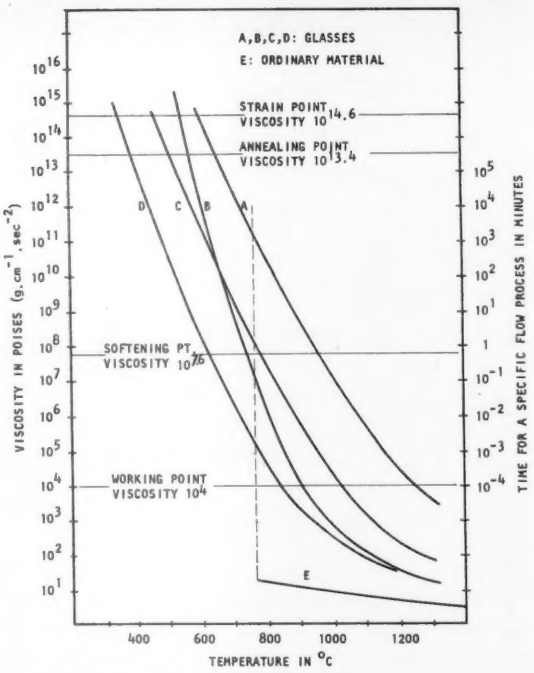
ANCIENT GLASSMAKING

continued

ern glasses. If one wishes, following chemical analysis of an ancient glass, the composition may be duplicated precisely using pure materials. One may, with complete validity, make use of studies and observations of contemporary techniques and of experimental work with selected modern glasses or with the synthetic duplicate of the ancient composition.

Glass chemists generally talk about viscosity rather than fluidity. Fluidity and viscosity have inverse relationship. As the temperature is increased, glass becomes more fluid and, inversely, less viscous; as the temperature is decreased, glass becomes less fluid and more viscous.

Since glass in general has no definite freezing-point temperature, one cannot use such a temperature to characterize a given glass in the same way as the melting point is used for most chemical compounds. Instead, one picks arbitrarily certain viscosities which can be measured in the laboratory, and records temperatures at which a particular composition has these viscosities. It must be remembered that it takes time for the glass to flow at elevated temperatures. This time, for a given specified flow process such as the sagging of a glass rod, is directly proportional to the viscosity. Temperature plays an important role, for the viscosity varies rapidly with temperature, and thus the time of an operation varies with temperature. If one watches "off-hand" blowing, where the glass is cooling freely in the air, one sees that at high temperatures the worker is forced to work quickly since the glass deforms easily; as it cools, his motions are slower and greater force is needed to distort the glass —in less than a minute it can become too viscous to be manipulated and must be reheated.



Typical viscosity-temperature curves, showing that different glass compositions have similar curves, and contrasting their behavior with that of a simple material such as table salt. Some of the important viscosities are defined. The variation of time for a given process, such as the fusing of a frit, is illustrated, but only over a limited range, from about .02 seconds to about 100 hours. If one considers a different process, then the time scale should be slid up or down to fit it.

BEFORE THE INVENTION of the blowpipe, the two main techniques used for making glass vessels were molding and the so-called sand-core process. Here we shall confine discussion to the first of these two techniques. Many small Egyptian figures and inlays dating from the New Kingdom (1555-1090 B.C.) appear to have been molded. Later, the Alexandrian-Roman glassmakers (first century B.C.—first century A.D.) were amazingly adept at molding very complex shapes from frits, short sections of patterned canes, long sections (perhaps pre-curved), irregular pieces, etc.* This technique has a very long history, for some shallow bowls of the Islamic period were also molded, a thousand years after the invention of glass blowing.

Molds can be used in the following ways: (1) glass can be cast, either by actually pouring the hot glass into a hot mold, or by melting small bits of glass (frit); (2) small pieces or sections of glass cane can be fused, with very little flow of glass; (3) hot glass can be pressed with a plunger until it is forced to fill the mold; finally, (4) glass can be blown into a mold. We shall discuss each of these methods as they may have been used in ancient times, although the fourth method actually belongs in a separate category.

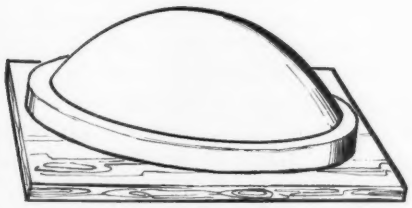
In casting techniques, the material of the mold must be a ceramic, the temperatures must be fairly high (800°-1000° C.) and the glass must become quite fluid. The glass can be put into the mold either as a fine powder or in fairly coarse pieces. Mold and glass can then be kept in the furnace until the glass melts, flows down and fills the mold. After the glass has flowed down into the mold, there are no forces to distort it, and, if the glass is left in the hot furnace, any air bubbles will become spherical.

* *Frit:* crushed or powdered glass; *cane:* an elongated rod of glass, usually with a circular cross-section, which has been pulled out of a larger mass.

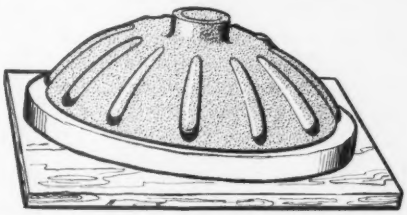
With this article—the first of two describing methods of making glass in the Classical world, as established by actual experiments—we continue our series on ancient techniques. The author, who holds degrees from the University of Wisconsin, is a physical chemist. In recent years he has been studying the mechanisms of photosensitivity and crystal growth in the research laboratories of the Corning Glass Works. He was in charge of the Scientific Research Program on ancient glass, sponsored by the Corning Museum of Glass, for two years, and these articles are the result of that study. He is at present with Aerophysics, Santa Barbara, California.

Dr. Schuler wishes to acknowledge the generous help and advice of Frederick Carder, Corning, New York, and that of Stanley Weisenfeld, chief photographer, Corning Glass Works.

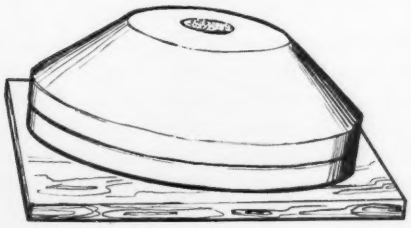
Casting a glass vessel by the lost wax process:



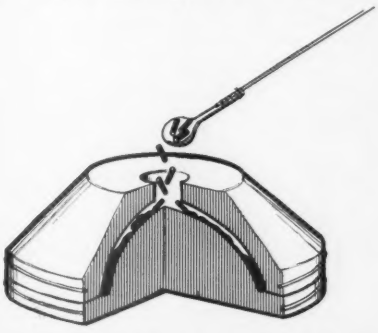
a. The material used for the mold was one part plaster of Paris and one part very fine sand, mixed in water, then placed on a simple vertical lathe and shaped with a template while still plastic. When the core was formed it was dried in air.



b. Next, hot wax was applied with a brush and shaped with a template. Ribs of wax were shaped and applied, and a lump of wax was applied at the top to form a cavity for holding glass. (In a two-part mold clay can be used instead.)



c. The wax was covered with more of the plaster mixture and then dried. (If the mold is to be a two-part mold, the region at the base where the new plaster would be in contact with the old should be covered with a thin clay wash.) Now the wax was melted out with the mold inverted. (If, instead, a two-part mold is made, then the parts are separated, cleaned of clay and reassembled with a little fresh plaster mix to seal the joint.) The mold was wrapped with nichrome wire so that if by chance it cracked during the process, it would still retain the glass.



d. The mold was placed in a furnace and heated slowly to 700° C. At this point small pieces of glass (actually bits of cane about ¼ inch in diameter and ½ inch long) were placed, by means of a spoon at the end of an iron bar, in the hollow part of the top of the mold. The temperature was gradually increased, and as the glass melted down, more was added periodically. (The temperature might have been held at 800° C. if the process were to take longer.) The glass flowed down and filled the space in the mold; eventually there was excess glass in the hollow space at the top. When the temperature reached 1000° C., and glass was observed at the top, the mold was assumed to be completely filled, and the furnace was cooled. When cold enough to handle, the mold was taken out and broken apart.

The ribbed bowl (right) was perfect, without any flaws but containing some spherical air bubbles. The lump of glass at what now became the base of the vessel was ground off. Further polishing might be done, but the glass reproduces the mold surface exactly. The smoothness of the finished vessel thus depends on the care taken with the mold. For comparison, the bowl is shown with a ribbed Roman bowl of about the first century A.D.

ANCIENT GLASSMAKING

continued

The types of ancient cast vessels range from simple, shallow bowls to more complex shapes with undercutting. For more elaborate shapes the "lost wax" *(cire perdue)* method for making the mold must be postulated (see illustrations on page 49), but the method of using it and of handling the glass would have been the same as for the simple shapes. Since the texture or surface of the mold is faithfully reproduced and thin walls can be made, grinding and polishing are not required. It is also possible to pour hot glass directly from a crucible into a pre-heated mold, but this is more difficult. It is impossible to pour it into a cold mold, for the glass is chilled and becomes rigid, and as glass is a poor conductor of heat, additional hot glass will not remelt the chilled portion.

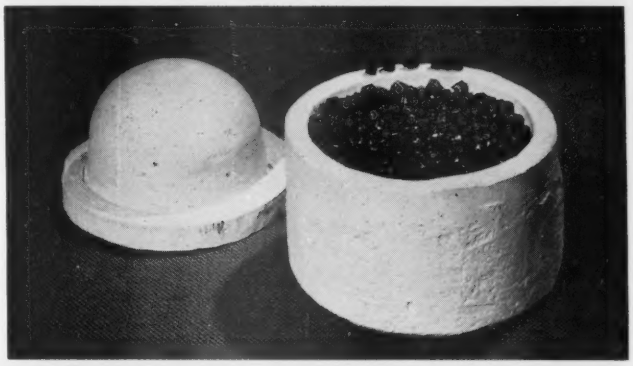
In fusion techniques, short sections of patterned canes or irregularly shaped pieces are fused together to form shallow bowls. The mold must be a ceramic, as in casting, but the temperatures can be lower (600°-700° C.) and the glass, therefore, less fluid. Mold and glass are placed in the furnace and heated until the little cane sections deform, flow sufficiently to fill the spaces between, and seal together. Fused shallow bowls were common in the first centuries before and after Christ. In these bowls, the sections of cane themselves were made by elaborate techniques the details of which are not yet known. As certain bowls reveal deliberate arrangements of these canes, it is clear that they were arranged by hand and not just thrown together in a mold. Therefore one must expect fairly simple designs, as otherwise the canes would fall into the center of the mold. Air bubbles with odd shapes and smooth, rounded surfaces might be expected where air was trapped between canes, but apparently the ancient artisan had little difficulty in avoiding air bubbles. (Experiments have produced pieces with only a few minute spherical bubbles.)

A third method of producing glass vessels is pressing, which requires a ceramic or metal mold. The temperature of the glass must be high (about 1000° C.) and its consistency quite fluid. The time involved is only a few seconds. The glass is transferred to the mold by being poured from a crucible or by being permitted to flow off a punty (a metal rod tipped with molten glass whose use will be discussed in detail in the second article on glass techniques). When a plunger is applied to press the glass, the glass flows rapidly and any bubbles it may contain will be distorted considerably and in a rather unpredictable manner. The design of mold and plunger must be quite simple. Since it is hard to align plunger and mold without machinery, it is difficult to make thin-walled bowls by pressing, and impossible to produce undercut shapes. Therefore, to explain the manufacture of thin-walled or undercut shapes in ancient times, one is forced to assume that other techniques were used, either casting as described or grinding and polishing from massive pieces.

Mold-blowing must be briefly considered here because certain mold-blown bowls have shapes similar to those produced by casting, and one must learn to distinguish them. To produce a mold-blown vessel a paraison, or gob, of glass on the end of a blow iron is lowered into a ceramic, metal or wetted wooden mold and inflated

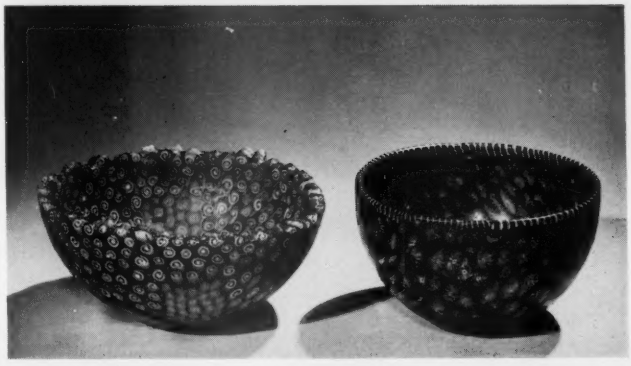
Fusing a mosaic glass vessel:

The same material was used for the mold as in the casting process, and the mold was made in the same way. In this case the inner part of the mold was dried and covered with a thin clay wash, and the outer part was then cast upon it. They were then separated, and the inner mold was carved down to allow for the thickness of the canes that were to be used (about ¼ inch). Thus there were two molds, with a ¼-inch gap between them when the lip of the top section rested on the ledge of the bottom section.



The short cane sections were arranged standing on end in the chosen pattern. It was found that they could be packed closely and would follow the curvature of the wall even when it became vertical. Small spaces remained between the canes. They were then sprayed with an organic resin which would burn off, and the top was then carefully put on. (The resin permitted touching the canes without dislodging them.) The top would not drop down to let the rim rest on the ledge, because the canes were of uneven length.

The mold was placed in a furnace and the temperature was brought up to 725° C. At about 700° C. the canes started to deform and the top section of the mold to drop down. When the lip of the top rested on the edge of the bottom mold, the canes deformed and flowed, filling the void space completely. The glass was held at 725° for three hours. (Earlier experiments at lower temperatures produced not quite perfect bowls, with spaces between some of the canes. If the time had been longer, somewhat lower temperatures would have been successful.)



The glass was cooled slowly and the molds were later separated easily and the glass bowl lifted out without difficulty. This technique produces a good surface both inside and out, so that very little finishing is required except for grinding the rim. The millefiori bowl at right is Roman (probably from Alexandria) and dates from the period first century B.C.—first century A.D.

Photographs courtesy of Corning Museum of Glass.

ANCIENT GLASSMAKING

continued

until it touches the surface. The temperature of the glass is high (about 1000° C., but cooling rapidly), and the time involved only a few seconds, so that the wood will not burn, although it may char and the water be converted to steam. As the paraison elongates when hanging down, the bubbles in the walls of the finished vessel are usually somewhat stretched. The wall thickness is generally uniform, but certain regions are stretched more than others, depending on the mold design. There may be sharper curves on the outside, where the glass is in contact with the mold, more rounded curves on the inside, at least in thick vessels.

THE ABOVE DISCUSSION may be used to set up criteria that would give insight into the manufacturing technique of a given piece. One may examine surface marks and finish, wall thickness and shape, and bubbles. As will be shown later, "off-hand" blowing gives the smoothest surface. Of the molding techniques, mold-blowing, if rotation is possible, produces the best surface, but without rotation all the molding techniques give about the same smoothness. As a great many ancient pieces were finished and decorated by grinding and polishing, traces which might give clues to the techniques used are often removed. One must be cautious in using the shapes of bubbles as criteria. In processes where the glass is stretched or flows, the bubbles are naturally distorted, but small bubbles resist distortion, so that a bubble must be at least 2 mm. in diameter in order to be significant. If the glass is cooled quickly, as in mold-blowing and pressing, then the distorted bubbles are "frozen in"; if the glass is permitted to remain hot, as is likely in mold-casting, then the bubbles become spherical. In the latter case, however, the glass must flow to fill the mold; if the furnace happens to be cooled at just the right time, the bubbles might be distorted.

Experiments in producing glass vessels by means of two of the techniques just discussed—casting and fusing—were conducted as part of the Scientific Research Program of the Corning Museum of Glass. Each of these experiments is here illustrated and described.

For the casting process, a shallow ribbed bowl shape was chosen as being neither too simple nor too complex. The bowl could have been made either in a two-part mold or by the lost wax process. The latter method was the one chosen. As a result of the experiment it became clear that such pieces could be produced without flaws and requiring very little additional grinding or polishing.

In the case of vessels made by mold-fusion, the first experiments were with open molds. It was found that while the canes could be placed in them easily enough, upon fusing, the upper edge of the bowl collapsed and fell into the center. Two-part molds were then tried, with the results described. With further studies one should be able to find the technique which gives exactly the same type of flow pattern that can be seen in ancient pieces. This investigation will be continued under the research program of the Museum.

Highlights of the SUMMER *issue of* ARCHAEOLOGY

NIPPUR, THE HOLY CITY
by Vaughn E. Crawford

TWO CARVED HUMAN BONES FROM CHIAPAS
by Keith A. Dixon

ALBA FUCENS: A ROMAN COLONY
by Fernand De Visscher

THE PREHISTORIC MOUND OF KARANOVO
by Vasil Mikov

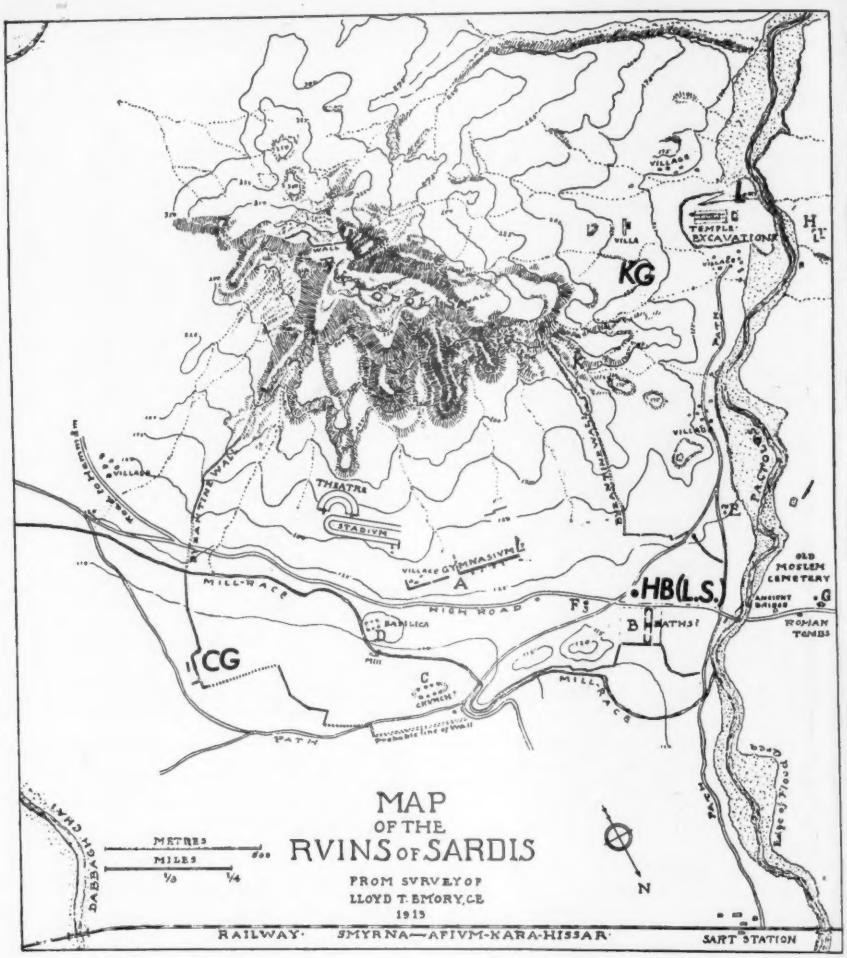
1. The acropolis and ruins of Sardis from the west. The fertile Hermus Plain (foreground) was staging area for the armies of Croesus, the Persian kings and Alexander the Great. The white houses mark the place where the highway crosses the Pactolus. The modern highway follows the same general route as the famous Royal Road of the Persian kings.

NEW EXPLORATIONS AT SARDIS

By
GEORGE M. A. HANFMANN
and
A. HENRY DETWEILER

IN THE YEAR 550 B.C. Sardis, the capital of Lydia, in western Asia Minor, had reached the zenith of her wealth, power and fame. Greek cities of Ionia vied for the favor of King Croesus, who in turn gave huge marble columns to the temple of Artemis in subject Ephesus and sent fabulous presents to sanctuaries and oracles throughout Greece. Four years later the great Lydian kingdom collapsed under the onslaught of Cyrus, when Persian warriors stormed the craggy citadel of Sardis (Figure 1). Croesus died, but his fabulous wealth and his dramatic downfall lived on in many legends.

A center of Persian administration in the West, Sardis figured time and again in the history of the great war between Greece and the Achaemenid Empire. In 499 B.C. the war was started by rebellious Ionians who marched up from the coast and burned the city. A temple of the goddess Cybele was destroyed, "which was the reason alleged by the Persians for setting on fire the temples of Greece" (Herod. v.102). It was on the Sardian Plain that Xerxes assembled his vast host. Here stood the exiled Themistocles, the savior of Greece at Salamis, and looked at a statue which he had once dedi-



2. Map of the ruins of Sardis, revised after H. C. Butler, *Sardis I, The Excavations 1910-1914* (1922). The new excavations, begun in 1958, are being carried out in the Pactolus Valley, near the temple of Artemis, and on the Hermus Plain.

GEORGE M. A. HANFMANN, Field Director of the new Sardis excavations, is Professor of Fine Arts at Harvard and Curator of Classical Art at the Fogg Museum. He has inherited his interest in Sardis from his predecessor at Harvard, George Henry Chase, who was a member of the first Sardis expedition in 1914. A. Henry Detweiler, Field Advisor and Associate Director of the Sardis excavation, has taken part in many excavations in Mesopotamia, Syria and Palestine. He is Associate Dean of the College of Architecture and Professor of Architecture at Cornell University, and President of the American Schools of Oriental Research.

The new expedition to Sardis is a joint undertaking of the Fogg Art Museum and Cornell University under the auspices of the American Schools of Oriental Research with the support of the Bollingen Foundation of New York. Additional means were also received from a group known as Supporters of Sardis. The campaign was directed by Professor George M. A. Hanfmann of Harvard University and Professor A. Henry Detweiler of Cornell University. The Turkish Department of Antiquities was represented by Bay Kemal Ziya Polatkan, Director of the Manisa Museum, as Commissioner, and Dr. Baki Ögün of the University of Ankara as Assistant Commissioner. Other staff members were Professor Thomas H. Canfield, Cornell, and Professor Marion Dean Ross, University of Oregon, architects; Mr. Donald P. Hansen, Harvard, archaeologist; Mr. John Washeba, Harvard, conservator; Dean Sherman E. Johnson, The Church Divinity School of the Pacific, epigrapher and archaeologist; Mrs. Catherine S. Detweiler, numismatist; Mrs. Ilse Hanfmann, recorder; and as volunteers, Mrs. Jean Johnson and Miss Lenore Keene, assistant recorders; Mr. Arthur S. Steinberg, Harvard, archaeologist. Mr. Güven Bakir was employed as draftsman.

SARDIS continued

3. Trench south of the temple of Artemis. The deep lines in the wall of the trench were drawn by excavators to show the irregular course of the strata of an ancient torrent bed, which has also left behind it the stones in the foreground. In the middle ground, the colossal temple of Artemis, excavated by H. C. Butler between 1910 and 1914. The temple dates from early Hellenistic times.

cated at Athens and which the Persians had carried off to Sardis. Later, during the war between Athens and Sparta, the brilliant Alcibiades was seized here by the Persian satrap Tissaphernes and kept prisoner on the citadel, from which he then escaped to the coast. Xenophon brought here a sacrifice to Artemis before he set out with his Ten Thousand on his march to Mesopotamia. From the eagle aerie of the acropolis Alexander the Great looked down upon the Macedonian host as Zeus revealed to him in a thunderstorm that he must build him a temple "just over the palace of the Lydian kings" (Arrian, *Anab.* i.17). Seleucid and Pergamene kings battled over Sardis and another spectacular capture of the acropolis was effected when soldiers of King Antiochus III climbed its sheer cliffs from the theater. With the bequest of the last king of Pergamon, Sardis came under the sway of the Romans, to lead a less dramatic but prosperous existence as one of the great cities in the Province of Asia. Christianity came early to Sardis—part of the Revelation of St. John is addressed "unto the angel of the church in Sardis." The church father Melito (around A.D. 170) was Bishop of Sardis; the metropolitan see of Sardis is mentioned until well into the middle Byzantine era. After two centuries of fighting between Seljuk Turks and Byzantines, Tamerlane's great raid to the sea (A.D. 1402) wiped out Sardis as a city. Only a small village perpetuated the ancient name. Vast ruins of Roman and Byzantine times remained standing in the Hermus Plain and parts of the citadel hung precariously over precipices. In the side valley of the Pactolus, two lonely columns rose above the tremendous landslide which had buried the temple of Artemis.

AN AMERICAN EXPEDITION organized by Howard Crosby Butler of Princeton University excavated at Sardis from 1910 to 1914, and again in 1922. Its members freed the colossal temple of Artemis, which dates from early Hellenistic times, and opened more than a thousand Lydian graves cut into the precipitous ridges of the Pactolus Valley. Part of the impressive finds came to the Metropolitan Museum in New York, other objects, notably gold ornaments, jewelry and gems, enriched the Archaeological Museum in Istanbul, but much of the material was lost in the turbulent years following the First World War, and many problems remained unresolved. Although the general position of the large Roman and Byzantine ruins (Figure 2: theater, stadium, points A,B,C,D) was entered on a survey plan, none of these had been excavated and recorded, and the location of the city of the Lydian kings remained in doubt.

Last summer the work was resumed in a joint operation of Cornell University and the Fogg Art Museum of

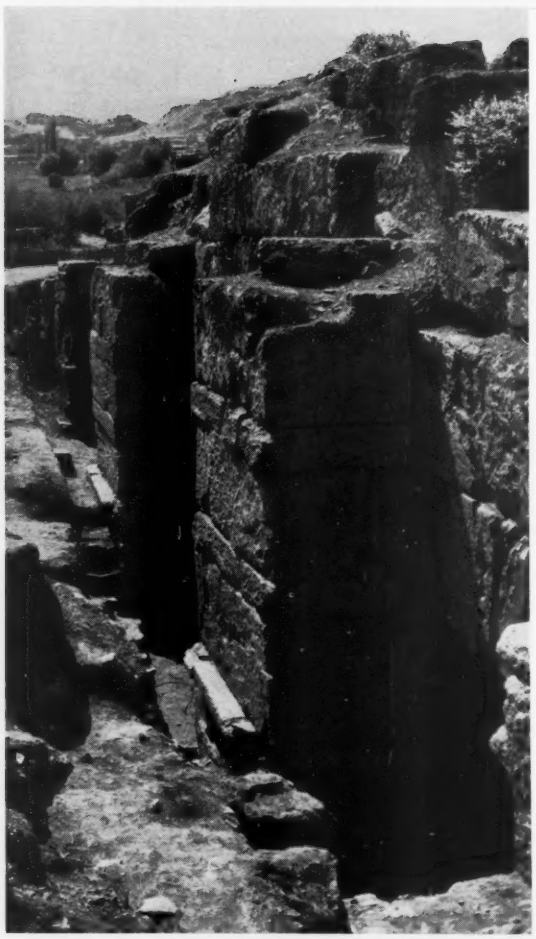
4. A Lydian inscription incised on the shoulder of a jug. Read from right to left, the letters say: RLAM. Sixth or early fifth century B.C. Length about 2" inches.

SARDIS continued

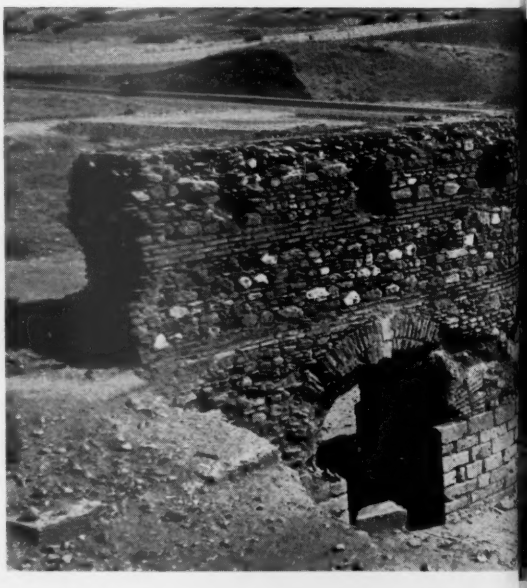
Harvard. Our major aim is to study the development of Sardis as an urban center from prehistoric times through the Islamic period. During this first campaign, in 1958, we initiated the excavation and recording of two of the great ruins and searched for the location of the city of the Lydian period.

Butler had suggested that an archaic sanctuary of the time of Croesus lay under the Roman and Hellenistic levels of the Artemis precinct. To test this possibility we excavated two areas in the precinct and made a sounding on a hill nearby. Our first sounding (Figure 3) revealed an ancient torrent bed; only hard-pan (virgin soil) was underneath. To judge from the sherds which the stream carried with it, the southern part of the sanctuary was periodically flooded from about the tenth until the fifth century B.C. From the strata of sand and gravel we retrieved a Lydian inscription (Figure 4) and a terracotta die. The latter brings to mind Herodotus' story (i.94) about a famine in Lydia during which the Lydians ate one day and played games the next in order to forget their hunger. He names dice as one of the games the Lydians invented for this purpose. (Actually, however, much earlier dice are known from Mesopotamia.)

The same stream, or one very much like it, ran under the Roman building L (see Figure 2), located on a terrace some fifty feet south of the Artemis temple. Over the torrent bed was a layer of ashes and sherds, of which



5. The enigmatic building CG after partial excavation. In the foreground of this view of the eastern façade appears the arch of the first vaulted chamber; south of it, between piers, is the main arch, which passes through the structure, and two vaulted chambers, which open to the east. The oblong structure, here seen from the north, measures approximately 100 feet in length and (including the piers) nearly 30 feet in width. The height from top to impost course of the piers is about twenty feet. Some seven feet farther down, the excavators came upon the crown of an arch of a lower story.



6. South hall of building B, partial view of interior after the excavation of 1958, showing parts of the east wall and the beginning of the southern apse. The debris piled to above the tops of the arches in the unexcavated part comes from the collapsed vaults which spanned this vast (nearly 40 feet wide) apsidal hall. The ancient stones on upper level (at right) are said by local inhabitants to have served as supports of poles of modern stables. According to the inscription of Lucius Verus, this may have been part of a gymnasium.

the earliest belong to the fifth century B.C. Apparently at that time the bed was filled in, or the stream diverted, and the sanctuary was extended to this area. The Roman building (of which Butler had cleared the three northern rooms) was arranged in two parallel sequences. It was still in use around A.D. 400, but then its southern end was smashed by large stones which cannonaded into it, perhaps during an earthquake. Subsequently, the Byzantines used this area as a burial ground. Around 1200 some squatters moved into the ruin and left behind them coins, glass bracelets and Byzantine glazed pottery.

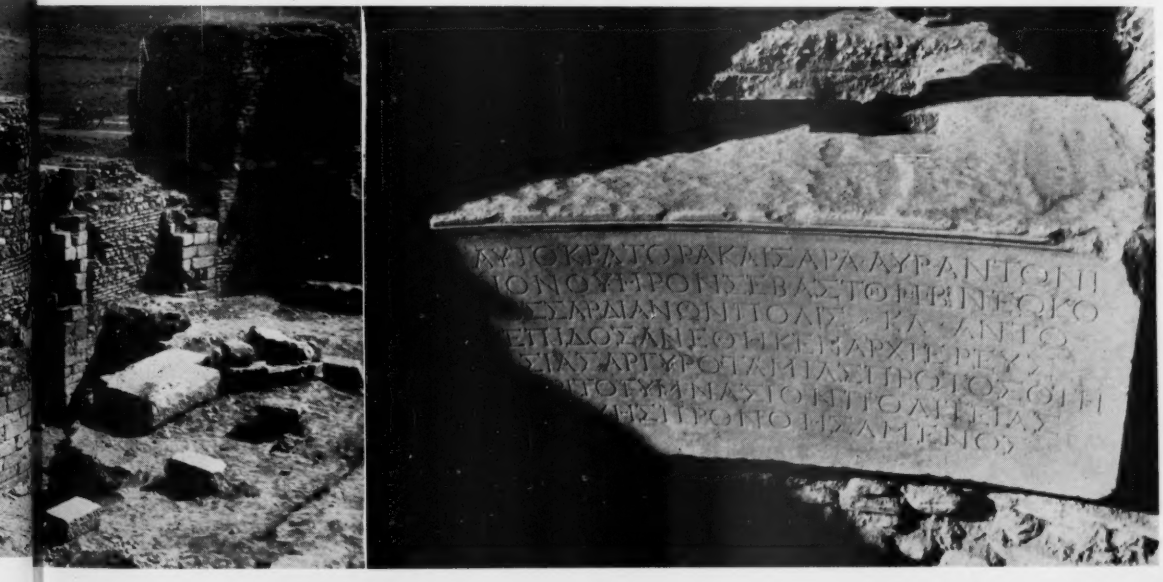
It has now become doubtful whether an archaic temple was really located under the colossal structure of Hellenistic times. If an archaic sanctuary existed, it may have been situated higher up on the acropolis slope.

The flat-topped hill which rises to the northeast of the sanctuary (visible just to the left of the column tops in Figure 3; KG, Figure 2) rejoices in the name of Kagirlik Tepe, "Bamboo Hill." There we made a stepped sounding which revealed a number of Roman graves. The more elaborate sepulchers were built of brick and covered with stone slabs. Others were made of tiles placed edge to edge to form a gabled shelter. We found no indication of any early buildings.

In the meantime, some two miles away, in a low-lying part of the Hermus Plain, we began the excavation of a curious and, so far, mysterious structure (CG, Figure 2). Two large parallel walls of limestone masonry were visible above ground; our hope, like Butler's, was that they might be part of a city gate. However, the excavation of the eastern part of this complex has produced one surprise after another, and is likely to do so in the future.

As matters now stand, this eastern structure is an oblong of limestone masonry with one large arch and several recesses; one blind corridor and two niches, all barrel-vaulted, open from the eastern façade (Figure 5); two half-domed recesses open on the west side. In the last days of digging, a hemicycle began to emerge at the northern end. Byzantine coins, pottery and glass show that the structure was reused in Byzantine times, when various industrial establishments left considerable deposits of coal, ashes, calcinated marble and slag-like matter along the west side. Nothing is known yet about the original date and purpose of the structure; we are certain only that another story lies buried under the one

7. The marble base for a statue of Lucius Verus. In the background is the arched central window of the south apse of building B. The statue base was placed against it on a high platform which ran around the apse. Approximate length of the curving base is 7 feet, the height nearly 3 feet. The inscription says, "The city of Sardis twice honored with imperial cult (neocorate) (honors) the Emperor Caesar Aurelius Antoninus Verus Augustus. Claudius Antonius Lepidus, Chief Priest of Asia, First Treasurer, who from the beginning took care of the administration of the gymnasium, dedicated (the statue)."



SARDIS continued

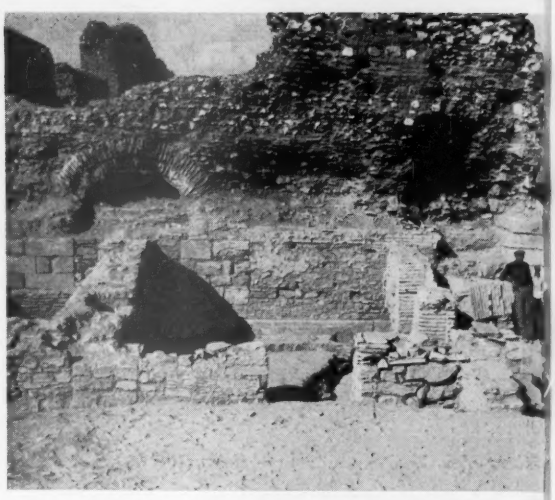
we have been excavating. A western oblong, exactly parallel to the eastern, is partly visible above ground, and rising ground to the north suggests that additional parts of the complex extend to the north.

Some three hundred yards east of the bridge over the Pactolus lies the vast building designated as B (Figure 6). It consists of two apsidal halls and a central unit (the latter is omitted on Butler's plan, Figure 2). It features large piers of limestone (and marble?) masonry and walls made of alternate courses of brick and cemented rubble. During the 1958 campaign we cleared part of the south façade, which has a central window, several bays of the long east side, both outside and inside, and traced somewhat over half of the south apse on the inside. Placed centrally on a raised platform associated with the apse there appeared an inscribed statue base (Figure 7) which may prove an important clue to the function of the building.

The inscription says that one Claudius Antonius Lepidus, Chief Priest of Asia, dedicated a statue of the Emperor Lucius Verus (A.D. 161-169), and that the dedicant "from the beginning took care of the administration of the gymnasium," according to the interpretation by Prof. Louis Robert. The probability is strong that this vast hall was a central part of a Roman gymnasium. A statue honoring the emperor was most likely to have been erected on the occasion of an imperial visit, perhaps in A.D. 165, when Verus returned in triumph from his wars with the Parthians. Curiously, the "Apology for the Christian Faith" by Melito, Bishop of Sardis (Eusebius, *Church History* iv.13,8), was addressed to the same Emperor Verus. Was it, perhaps, presented to the emperor at Sardis?

Careful examination of the ungainly rubble base showed traces of colorful marble revetments. Apparently, the entire building had elaborate marble decoration, but most of it went into lime-kilns. Several layers of lime and ashes which we observed in the interior give testimony of this destructive activity. A delicately worked, brilliantly polished foot belonging to an over-life-size Roman statue of the second century A.D. escaped this sad fate. It might be from a statue of Lucius Verus.

In front of the south end of building B we found a row of early Byzantine shops and excavated three of them (Figure 8). Large quantities of animal bones, charcoal and broken glass vessels suggest that they may have been restaurants. Among the small objects found was an *ampulla,* a small terracotta flask, decorated with a cross



8. Early Byzantine shops built against the south façade of building B. The statue base of Lucius Verus stood just inside the arched window visible over the wall of the shop on the left. The shops, which were abandoned during the rule of the Emperor Heraclius (A.D. 610-641), extended to the right (east) beyond the façade of B. One complete shop and parts of two others are seen. They yielded finds of Byzantine glass and coins.

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(Figure 9). Like the majority of the coins found in the shops, it seems of the late sixth or early seventh century.

A SOUNDING made during the last three weeks across the road from building B (HB-LS in Figure 2) produced a dramatic finish for the campaign. Almost immediately under the surface of a melon patch there appeared the substantial walls of a residential complex (called by the excavators the "House of Bronzes"), located on two levels (Figure 10). Two vaulted chambers and two long rooms or courtyards along the east side of the trench constituted the basement units, while a small staircase, a room carefully paved with large tiles and a somewhat disrupted area were on a higher level.

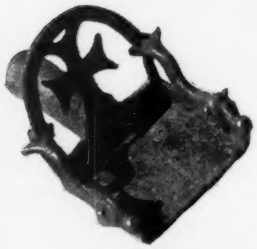
In the vaulted room where a big pithos, or storage jar, stood in the corner (Figure 11), we found a number of interesting late Roman and Early Christian bronze vessels and utensils, including a wine flagon and two vessels with inner tubes, for heating liquids. Two incense burners, originally suspended from chains, were found flanking a curious shovel-like implement surmounted by a cross (Figure 12).

A large bronze cauldron or brazier came to light in another basement unit. A statue of Bacchus (Figure 13) stood on the floor of the same room, while several stone basins and mortars were stacked beside it. The House of

9. A "pilgrim flask" from the Byzantine shops. Such *ampullae* presumably contained holy water or oil. This small flask of baked clay is of the "Asiatic" type, and is decorated with a cross in relief and concentric circles framed by a laurel wreath. Sixth or early seventh century A.D. Height about 3 inches.

10. Part of the Early Christian House of Bronzes and the Lydian Shop. The Lydian potter's shop (of around 600 B.C.) is in the foreground. In its right (southwest) corner, a channel of stones leads to a circular oven or kiln of river stones. Beyond, on the left, two vaulted basement rooms of the House of Bronzes; in the upper left corner, part of a staircase; on the right, the upper level of the House of Bronzes. Most of the bronzes were found in the room with the storage jar.

11. Basement room 1 in the House of Bronzes and some of its objects. Along the southern wall, a storage jar, a bronze wine flagon and a pottery bowl. In front of the jar a large pottery plate. The white stone at left is part of a support for the stairs.



12. This "embers shovel" and two bronze censers were found in the northeast corner of room 1 of the House of Bronzes. The handle is hollow, the shovel is surmounted by a cross under an arch, while two dolphins jump down the sides. Bronze shovels for shoveling incense or carrying embers on which incense was thrown were used in pagan rites and, according to some scholars, also in Jewish ritual. Height 3⅜ inches, length nearly 5½ inches.

13. Small marble statue of a pagan god found in a basement area of the House of Bronzes. The youthful god, whose face is mutilated, is leaning against a pillar. Faint traces of grapes and leaves in a wreath on his head suggest that he is Bacchus, god of wine. Probably third century A.D. Height, with pillar, nearly 3 feet.

14. *Above:* Two "lydia" from the Lydian Shop. These wide-necked miniature jars on conical feet, known as "lydia," are thought to have been used as containers for unguents, for which the Lydians were famous. These two examples are from the late seventh century B.C. Height: 3¼ inches (left), 4⅜ inches (right).

15. *Right:* A Lydian "Waveline" hydria from the Lydian Shop. The small holes for lead clamps indicate that the vase had undergone amazingly extensive repairs or perhaps was being repaired at the time when the shop was abandoned. The vase is decorated with reddish "glaze" paint over brown slip. Height 11½ inches.

SARDIS continued

Bronzes evidently perished in a violent conflagration. Apparently the inhabitants made no attempt to retrieve their belongings, which had toppled from shelves onto the floor and were buried under the debris.

The last owner was obviously a Christian; the liturgical implements indicate that he may have been a member of the clergy. Yet the statue of a pagan god (Bacchus?) still stood in the basement, even though the face had been mutilated. Coins found so far in the house belong to the time of Constantine and his sons; it would be tempting to connect the destruction with the anti-Christian policy of Emperor Julian (A.D. 361-363), but more evidence is needed before we can determine exactly the time when the House of Bronzes perished.

During the last ten days we made our final attempt to penetrate to deeper levels by going down below the basement floor of the Early Christian house in an area bounded by two foundation walls (see Figure 10). Only three to four feet below the basement level our workmen came upon "nests" of Lydian vases nearly a thousand years earlier in date than the finds in the House of Bronzes. Some of these were of Lydian Geometric style (Figure 14), others very close imitations of Eastern Greek "Waveline" wares (Figure 15). Identifiable parts of some thirty vases and many fragments were found in this small space. Remnants of a wall of riverstones and a floor covered with ashes made it clear that this was not an accidental deposit of pottery. A semicircular structure in the corner with a stone-framed channel leading to it was either an oven or a pottery kiln. We interpret these finds as belonging to the workshop of a Lydian potter.

This "Lydian Shop" came to a sudden end around 600 B.C.; the date is rendered fairly certain by an imported Greek sherd from Rhodes (Figure 16). In the literary sources there are some hints of an incursion by the Kimmerians from South Russia around this time.

16. An imported Greek sherd from the Lydian Shop. This fine ware, featuring matt-black and red paints over a white slip, was made on the island of Rhodes. The head of a wild goat is seen on the left, the body of another on the right. The name "Wild Goat Ware" derives from such representations. Late seventh century B.C. Height 2¾ inches.

17. The great goddess Cybele. This small marble relief, 13¾ inches high, was found in a Roman or Byzantine wall north of the precinct of Artemis. Copied from a cult image of the fifth century B.C., the seated goddess holds a large tympanon (tambourine) in her left hand, a libation bowl in her right. A small lion is reclining on her lap, another lion sits dog-like at her feet. Although the workmanship is not skilled, format and style of this votive relief point to the fourth century B.C. Cybele was the most important goddess of Sardis; this is the earliest certain representation of the Cybele of Sardis yet known. This mountain goddess, whose Anatolian name was Kubaba, was widely worshiped by the pre-Greek, especially the Luvian-speaking, peoples of Asia Minor.

Herodotus says (i.15) they took all but the citadel.

When we dug a small pit in the corner of the Lydian Shop we found an earlier phase of Lydian pottery; black and gray monochrome vases predominated. Interesting fragments of painted wares with geometric designs show connections with Cilicia and Cyprus on one hand, Greek Geometric and Protogeometric styles on the other.

The discovery of the Lydian Shop is of great importance for the topography of Sardis. It provides evidence that the city of the Lydian kings was located on the northern foothills of the acropolis, beside the modern highway (see map), eastward from the Lydian Shop. Stray finds of archaic objects during our excavation of building B (an archaic terracotta revetment and the fragment of an Attic black-figure eye cup), as well as the discovery several years ago of an archaic statue which was built into a Roman wall on the left bank of the Pactolus, lend color to this assumption.

During the campaign, a number of fragments of sculpture and inscriptions were brought to the headquarters of the expedition from chance finds outside the excavation. Among these a small relief of the fourth century B.C. (Figure 17) is noteworthy because it is the earliest representation from Sardis of the goddess Cybele (Kubaba), who seems to have been the most famous of the local deities.

Our plans for the 1959 campaign call for continued excavation of the large building complexes at B and CG (see Figure 2) and systematic exploration of the newly discovered Lydian levels in the area of the House of Bronzes and on the terraces above. These may, of course, turn out to be considerably disrupted by later building; but we persist in the hope that some day we may yet come upon the palace of Croesus, which, according to the Roman architect Vitruvius (*On Architecture II,* 8:10), was still extant in Roman times.

ARCHAEOLOGICAL NEWS

Obituaries

We record with regret the deaths of these well known archaeologists:

BERT HODGE HILL, eminent authority on the archaeology of Greece, Director of the American School of Classical Studies at Athens, 1906-1926, director of excavations at Corinth and in Cyprus (died December 2, 1958, at the age of eighty-four).

M. ZAKARIA GONEIM, noted Egyptologist, Chief Inspector of Antiquities at Sakkara, perhaps best known for his discovery of the unfinished step pyramid at Sakkara (died January 11, 1959, at the age of forty-eight).

Sixtieth Annual Meeting of the AIA

The ARCHAEOLOGICAL INSTITUTE OF AMERICA held its sixtieth Annual Meeting at the Netherland Hilton Hotel in Cincinnati, December 28-30, 1958, joining forces, as is customary, with the American Philological Association. About 450 members were registered for the two meetings. A total of twenty-eight papers was presented during five sessions, of which twelve were reports on current excavations or aspects of those excavations.

The first session was opened by Nelson Glueck, who described the methodical exploration of the Negev in southern Israel during the past seven years. More than four hundred ancient sites from all periods have been found; the times of most intensive settlement were Middle Bronze I (twenty-first—nineteenth centuries B.C.), Iron Age II, the Nabataean period and the Byzantine period. In his paper, "The Nabataean Bitumen Industry at the Dead Sea," Philip C. Hammond essayed to establish the use of bitumen in the embalming trade of Ptolemaic and Roman Egypt, as described by Diodorus Siculus, and the extent and importance of the Nabataean trade in bitumen. Discussing Greek monasteries and their manuscripts, Morton Smith pointed out that an almost stratigraphic account of their intellectual history is preserved in the monastic libraries. Although they have been combed through for ancient texts, there is still material of value, including, it is hoped, both Old and New Testament pseudepigrapha. A welcome and appropriate innovation for the AIA was the synopsis of Central Ohio Valley prehistory given by James B. Griffin. The area has been occupied by man for more than 10,000 years, with cultures ranging back from the Fort Ancient derivative of Mississippian and Southeastern through Woodland, Hopewell and Adena to those of the long Archaic occupation and the Paleo-Indian period. The last paper of the session was "Excavations in Mallorca (Baleares)," by Daniel E. Woods, who described the past season's work by a joint American-Spanish expedition at Roman Pollentia, near Alcudia, and at the necropolis of Son Real. An account of this project will be published in a forthcoming issue of ARCHAEOLOGY.

The second session was devoted to Mycenaean studies and was held jointly with the APA. In his paper entitled "Troy, Macedonia and the North," Homer L. Thomas indicated that a reevaluation, occasioned by recent publications, of so-called northern material at Troy VIIb and at Macedonian sites might affect the presumed role of northern peoples in the movements which brought an end to Mycenaean civilization. George E. Mylonas reported on the 1958 excavations at Mycenae, the main purpose of which was to work out a sequence of structural periods. Careful examination, especially of walls and gates, showed three structural periods; the continuation of this examination should ultimately provide a more accurate chronology. J. L. Benson, speaking on "The Griffin in the Minoan-Mycenaean World," suggested that an investigation of Bronze Age griffins might assist in an understanding of Minoan-Mycenaean religious concepts. The last two papers at this joint session were concerned with Linear B. Saul Levin discussed the problem of verifying the Linear B decipherment, while the subject of the paper by Thalia Phillies Howe was "Linear B and Hesiod's Breadwinners."

Following cocktails and a luncheon tendered by the Cincinnati Art Museum, the third session was held in the museum auditorium. Three of the four papers given were on Gordion or finds from that amazing site. Machteld J. Mellink presented a report on the latest excavations at Gordion, which for the most part were preparation for tackling the eighth-century levels next year. Recent glass finds from Gordion were described by Axel von Saldern. Several well dated vessels and fragments have been found, including a mesomphalic cut glass bowl, undoubtedly a Mesopotamian import, from a late eighth-century burial, and a fragmentary gold glass bowl in a stratified context of the second half of the third century B.C. In his paper, "Oriental Bronze Cauldrons of the Eighth and Seventh Centuries," Rodney C. Young showed that the royal tomb at Gordion has produced Oriental prototypes, long sought in Anatolia, for various types of cauldron handles and attachments known from Greek sanctuaries for years. The last paper was "Excavations at Sardis, Capital of Lydia, 1958," by George M. A. Hanfmann. An account of this important new exploration of a famous city is to be found on pages 53-61 of this issue.

The fourth session continued the reports on current field work, the first of these being "Supplementary Excavations at Lerna and Eutresis, 1958," by John L. Caskey. The accessible parts of an Early Helladic building below the House of the Tiles, with a plan generally similar to that of the latter, were examined during a two-week period. At least one still earlier building phase from the Early Helladic was found, with only Neolithic material below

this. A supplementary testing at Eutresis in Boeotia was also carried out; for details of this dig, see below. Oscar Broneer reported on the continuation, in late 1957 and early 1958, of the excavations at Isthmia. Outstanding results were the discovery of a thirteenth-century B.C. fortification wall across the Isthmus of Corinth, the partial excavation of a huge circular pit with a fill of the sixth century containing pottery and bronzes, excavation of the east dump of the Temple of Poseidon and complete clearance of the temenos and foundation of the Palaimonion. Cyclopean and non-Cyclopean walls of the Isthmian fortification were described by William P. Donovan. The Cyclopean wall, which had fragments of Mycenaean pottery in the fill between the faces, could not be traced westward beyond a certain point; it may have returned to enclose the sanctuary or continued to the southwest and joined a known Cyclopean wall farther south. A polygonal wall of the late fifth or early fourth century was found southwest of the sanctuary. In his paper, "The Isthmian Fortifications in Oracular Prophecy," Edward Bodner suggested that an oracle found in fifteenth-century manuscripts, which is attributed to the Delphic Pythia and concerns four fortifications of the Isthmus of Corinth, was actually composed during the struggles of the Paleologues against the Turks, probably between 1423 and 1436. Two Panathenaic amphoras found during the Isthmian excavations were discussed by Franklin P. Johnson. Both are fragmentary, found in the north temple dump, both are inscribed and both are of about 500 B.C., but they were painted by different hands. The last paper of this session was a report by Richard Stillwell on the excavations at Serra Orlando during 1958. Among the most important developments were the finding of a new sanctuary to Demeter, the discovery of a necropolis of about 2000 B.C., which showed that prehistoric occupation of the site had not been limited to the "Cittadella," the uncovering of a long, covered portico in the Hellenistic agora and further evidence of occupation of the "Cittadella" area during the Bronze Age and also during the Archaic period.

The first paper of the fifth session was presented by Matthew I. Wiencke, "New Studies of the Parthenon Frieze in Athens." A new series of photographs of these sculptures, including all extant slabs, both those still in place and those in the Acropolis Museum, permits close study of significant details of carving, which offer valuable evidence for distinguishing sculptors and styles in the frieze. Evelyn B. Harrison in her paper, "The Relief Sculpture of the Temple of Ares in Athens," suggested that the fragments from high reliefs found around the Temple of Ares, the first discoveries of which were associated rather with the Altar of Ares, are more likely to belong to the inner friezes of the temple than to the altar; they occupy a place of special importance in the history of fifth-century sculpture. Elmer G. Suhr proposed in his paper, "The 'Catagusa' of Praxiteles," that the Archaic goddess of the Berlin Museum holds, not a pomegranate, but a spindle whorl in the right hand and can be identified as the spinning Aphrodite, and that a bronze female figure in Munich is a Roman copy of the Catagusa, or "Spinner," of Praxiteles, whose left hand would be free to draw down the wool from the distaff held under the left arm. Attic pottery found at Olympia, Charles Morgan suggested, may have come from the great feasts of Alcibiades mentioned by Thucydides and Plutarch, feasts held in the "workshop of Pheidias." Western Greek building techniques, it was pointed out by A. Trevor Hodge, differed in a number of points from those of mainland Greece. Column drums were cut without lifting bosses and rolled to the building site and lifted by some means that has left no trace; clamps were rare and no reliable examples of dowels are known, although holes for big wooden pegs are common at vital points. In discussing "The Architect in the Architectural Inscriptions," Robert L. Scranton concluded that although the evidence seems to show the Greek architect only occasionally raised above the general level of workmen, an investigation with a broader method of approach would be likely to raise the architect to a higher creative level.

Thanks to the Institute's committee on films and television, a number of archaeological films were shown at various times. At the joint evening meeting of the two societies Professor Gertrude Smith, President of the APA, gave a lucid and interesting address, "Some Reflections on Greek Law and Religion." The speaker at the joint dinner was Professor Emeritus Rhys Carpenter, whose subject, "Archaeology Now and Then," enabled him to discuss in his incomparable way the problems of archaeological evidence.

'Medieval Archaeology'—a New Journal

We call our readers' attention to an attractive new periodical, *Medieval Archaeology,* the first volume of which has recently appeared.

Published by the Society for Medieval Archaeology and edited by Donald B. Harden, Director of the London Museum, it is to deal chiefly with post-Roman Britain. The first number contains eight articles on a great variety of subjects—*Beowulf,* tree-rings, Jutish art, the Saxon house, and others—as well as a summary of field work in Britain during 1956, and book reviews.

Membership in the Society is open to all who are interested, and payment of the subscription fee (£2 2s.) automatically confers all the privileges of membership. Those interested may address The Secretary, Society for Medieval Archaeology, c/o The British Museum, London, W.C.1, England.

Investigation at Eutresis

In the 1920's the site of Eutresis, an ancient city located in Boeotia southwest of Thebes, was excavated by Dr. Hetty Goldman. Extensive remains of the Bronze Age came to light, as well as those of later habitations, and the discoveries were presented in a comprehensive publication (*Excavations at Eutresis in Boeotia,* by Hetty Goldman. Harvard University Press, Cambridge, Massachusetts 1931).

Recently, at Dr. Goldman's request, Dr. John L. Caskey, Director of the American School of Classical Studies at Athens, undertook a supplementary investigation, the purpose of which was to gain further information about the first inhabitants.

Cuttings observed in the virgin soil had indicated that the first settlers lived in small rounded huts, and pottery of late Neolithic types had been found in this lowest stratum, but Early Helladic wares were also present, in even larger quantity. Thus a question remained whether the huts

should be assigned to a Neolithic or an Early Helladic stage, and whether the two classes of pottery were perhaps for a time used simultaneously at this site.

In their attempt to shed further light on the problem the excavators were compelled to sacrifice some remains of the later phases. A trench was laid out in the southwestern part of the hilltop, running east-west through the area where previous excavation had revealed large sections of the Early Helladic settlement at considerable depths. This trench included the location of Building O (Early Helladic III) and the northern part of House L (Early Helladic II). At the level of House L the excavators found abundant pottery, including samples of the well known wares associated with Early Helladic II. A fine bronze fishhook, many sea shells and astonishing amounts of Melian obsidian gave new proof of the fact that this inland town was in regular touch with the sea.

Below the western end of House L were remains of an earlier building that had undergone reconstruction more than once. It is probably to be assigned to the final stages of Early Helladic I. Still lower, in the first meter of deposit, were found many successive pavements made of pebbles or small cobblestones. In the northeastern part of the trench the bottom courses of a thick stone wall came to light. A bedding for it had been cut in the hard-pan. It was curved, forming approximately a quadrant of a circle seven meters in diameter. The other three quarters of the structure (if it is indeed circular) lie beyond the limits of the trench. Near the center, which lies at the very corner of the trench, there is a deep cavity or irregular shaft extending into virgin soil. Efforts were made to follow this, removing the filling, but at a depth of about four meters the space became too narrow and the loose banks too dangerous; therefore the digging had to be stopped with the puzzle unsolved. The chasm is probably not a well, since it is located on naturally high ground, and water for Eutresis was undoubtedly drawn from the spring of Arkopodi at the foot of the hill.

Torso of Neolithic terracotta figure recently found at Eutresis.

The pottery of these lower strata is of the types described by Dr. Goldman, comprising principally heavy wares, many pieces of which are burnished to a high luster. Near, and directly upon, virgin soil were found fragments of Neolithic pots; and in most places Early Helladic sherds were present also. By good fortune, however, various small cavities and shallow depressions were found in the native soil, where appreciable amounts of the very earliest deposits had been left uncontaminated and, in some cases, even sealed off by the first of the tight pebble pavements. The sherds from these deposits appear all to be of Neolithic types. They have still to be studied in detail, but it already seems reasonably certain that they represent a Neolithic establishment which existed on the hill before the arrival of the first Early Helladic settlers. Further evidence of late Stone Age culture is supplied by the discovery of two fragmentary terracotta figurines depicting women of plump, if not positively obese, proportions.

The results of the investigation are to be published in *Hesperia.*

Twenty-fifth Anniversary of ESAF

The Annual Meeting of the Eastern States Archeological Federation was held in Wilmington, Delaware, November 8th and 9th, 1958. It celebrated the twenty-fifth anniversaries of the Federation and of the host organization, the Archaeological Society of Delaware. Sixteen papers were read on Saturday morning and afternoon and Sunday afternoon; the Sunday morning session was devoted to the business meeting and to a tour of the Hagley Museum and surroundings, where this meeting was held.

With one exception, a report on the archaeology of Nuku Hiva, Marquesas Islands, all the papers concerned—properly—the eastern States, from New York to West Virginia and Georgia, nearly half being on Pennsylvania. All but three reported on the excavation of a single site or several adjacent ones.

Probably of maximum interest and importance were a report by John Witthoft on a large dry rock shelter on the upper Juniata River, Pennsylvania, and one by Don W. Dragoo on the careful excavation and complete removal of an Adena mound near Moundsville, West Virginia. In the deep and only partially excavated rock shelter quantities of usually perishable materials, such as corn and other food products, wooden artifacts, cordage of Indian hemp and basswood, and several fragments of cloth, were found. The upper layers of the stratified deposit are Susquehannock of the early contact period. The Adena mound was typical, with a number of superimposed and sequent layers that evidently covered a considerable period of time—a crushed log tomb at the bottom, crematory basins, burials, and artifacts and mortuary objects of Adena type.

Robert C. Suggs traced the archaeological history of the Marquesas Islands from small isolated houses on the beach at about the beginning of the Christian era to great dance platforms and hill forts of megalithic masonry about A.D. 1400. There was an abrupt change in culture about A.D. 900.

Digests of all the papers will be published in the next Bulletin of the Federation.

J. ALDEN MASON

British Summer School

The British Summer School of Archaeology, as our readers will recall, meets each year at a different center and presents a series of lectures, discussions and excursions on the theme of a specific topic or problem. Here we offer a brief summary of the past season's meeting, in addition to the program scheduled for 1959.

Durham was the site of the 1958 session, from August 9th to August 16th, which was attended by three hun-

dred members. Eminent scholars in fields of art, architecture and letters delivered eight lectures in a series entitled "The Golden Age of Northumbria." Visits were made to Holy Island, St. Cuthbert's Cell on Farne Island, Ripon, Hexham, Bewcastle, Monkwearmouth and Jarrow, and to a large number of Anglo-Saxon churches in Northumberland, Cumberland and Durham.

This year the School will meet twice —in Douglas, Isle of Man, April 4th to 11th, and in Bangor, Wales, August 8th to 15th. The Douglas School will deal with the archaeology and history of the Isle of Man from earliest times to the Middle Ages. Lecture subjects will range from the physical background of the island to the earliest settlers, the Middle Ages, Celtic crosses and the pre-Norse church. Viking burials will also be discussed, as well as influences linking the island with the mainland. Visits to archaeological sites in every part of the island will be included.

The Bangor School will be devoted to a study of "Prehistoric and Roman Wales," with lectures by some eight well known archaeologists and historians. Again, visits to sites of archaeological interest will form a prominent part of the program.

The School welcomes as members all who are interested in archaeology, beginners and amateurs as well as veterans and professional scholars. American readers may obtain details of the 1959 Schools from Professor Sybil Gould, College of Wooster, Wooster, Ohio. European readers should write for information to F. T. Wainwright, Honorary Director of the British School of Archaeology, Department of Anglo-Saxon Studies, The University, St. Andrews, Scotland.

Successful Season at Hasanlu

As readers of LIFE Magazine are aware, the successes of the Joint Expedition to Hasanlu Tepe have been spectacular and are now famous. T. Cuyler Young, Jr., Assistant Field Director of the Hasanlu Project, has written for our benefit the following account of the 1958 season at the site which yielded the notable golden bowl:

During the summer of 1958 the Joint Expedition of the University Museum of the University of Pennsylvania and the Archaeological Service of Iran continued excavations, under the directorship of Robert H. Dyson, Jr., at Hasanlu Tepe in Azerbaijan, Iran (See ARCHAEOLOGY 9 [1956] 284-285 and 11 [1958] 128). The season's work had three main objectives.

Glazed terracotta wall plaque in form of human head, with beard and small pair of horns or horned cap. The head is hollow and the base flat and square. Found in the Burned Building of the ninth century B.C.

First, a sounding was made in the north flat of the Outer Town to augment and cross-check operations there the previous year. Virgin sand and water were struck at a depth of 8.45 meters, confirming results of the 1957 season. Again the initial phase of occupation was characterized by a Painted Orange Ware pottery dated by Carbon 14 to 2100-2000 B.C., while the upper strata yielded Burnished Gray and Burnished Red Ware pottery dated at present by Carbon 14 to 900-800 B.C. Missing in this area of the Outer Town, however, was the Burnished Gray and Whitish Ware in simple vase forms and loop-handled cups which had previously been found between the Painted Orange Ware phase and the Gray-Red Ware phase. This intervening period has been dated by Carbon 14 to the middle of the eleventh century B.C. Two notable burials, perhaps belonging to this period, were excavated in the operation: the first multiple and fractional burial found at Hasanlu, and a small but well constructed stone tomb holding a single burial.

The second main objective involved extensive explorations of the upper levels of the Citadel Mound. In the southwest quadrant of the mound a heavy stone fortification wall was uncovered, which may be part of the wall found on the north side of the citadel in 1957. Approximately 125 meters of this wall were disclosed; only its stone foundations, three meters wide on the average and at one point 2.6 meters deep, remained. The inner and outer surfaces were set with large roughly shaped blocks and the center filled with small stone rubble. Along that part of the wall excavated stand four evenly spaced tower foundations with two small bastions evenly spaced between the towers. Between the two bastions separating the two towers on the northwest end of the section excavated stands a gate two meters wide, paved with neatly cut sandstone slabs.

Horizontal excavation immediately within the fortification wall revealed two phases of town construction, both associated with the wall: above, crudely made, simple stone house foundations, and below, a large public building in mud brick set on stone foundations one meter high. This structure, known as the Burned Building, had been destroyed by fire and as a result was well preserved architecturally and provided an abundance of pottery and small finds. The pottery corresponded in type to the Gray-Red Ware of the upper strata of the Outer Town but was often finer in workmanship and more varied in shape. Most characteristic were highly burnished, red-slipped, deep, carinated bowls or pots with double handles finished at the top with "thumb" tabs which projected above the rim; and highly burnished Gray to Black Ware pots, without handles, and with vertical parallel grooves cut into slightly bulging bodies. Notable non-pottery finds included: a four-footed bronze double ring stand with human figures in relief on the legs; bronze vessels in a wide range of shapes and sizes; sword, spear and javelin points in iron; two bronze swords; and a glazed pottery wall plaque with a human head in relief (see photograph). These finds tentatively indicate connections with Anatolia, Assyria and the Caucasus. Also found was a silver drinking goblet with electrum repoussé figures depicting a military triumph, and the remarkable golden bowl. This latter, unique both in style and content, is a bucket-shaped vessel eight inches high and eight inches in diameter, covered with mythological figures in repoussé.

In order to gain a broader picture of

the history of occupation of the entire valley, soundings were also made at Dalmah Tepe and Hajji Firuz Tepe, small mounds some distance from the main mound. These yielded materials earlier than the lowest material from Hasanlu Tepe and established human occupation in the valley at least as early as 4000 B.C. A site survey of the entire valley showed nineteen Bronze Age mounds, a figure which corresponds closely with the present number of peasant villages in the same area.

AAA Meeting in Washington

Archaeology has played a smaller and smaller role in the meetings of the American Anthropological Association since the rise of the Society for American Archaeology. At the fifty-seventh Annual Meeting of the AAA, held in Washington, November 20-23, 1958, only four of the thirty-eight sessions were devoted specifically to archaeology, although there were papers at other sessions on various aspects of the field. These four sessions, with eighteen papers, treated of the Old World, Meso-America, North America, and the role of archaeology in historical research. One of the papers at the last named session was on the ethnohistorical aspect of archaeology on the Canadian frontier; this tied well with the paper which discussed the ethnohistorical approach in archaeology at the symposium devoted to the ethnohistorical concept in anthropology. Most of the papers at the first session on Cherokee-Iroquois questions were on archaeological problems. The symposium on "The Evolution of Man in the Light of Recent Discoveries" was likewise of interest to archaeologists, especially the paper on Shanidar man. Other single papers scattered over the meeting were on technical or theoretical aspects of archaeology, reflecting the interest in method and theory found among most American anthropologists today. Most archaeological interest in specific areas, however, centered on North America.

J. ALDEN MASON

Spiro Material at Smithsonian

One of the richest deposits of native ceremonial material found in the United States is that yielded by the great mound near Spiro, Oklahoma. This mound, generally dated to the thirteenth or fourteenth century A.D., belongs to the Mississippi period of the Southeast; it contains no traces of European contact. Many resemblances exist between its contents and those of the Etowah mound in Georgia.

In addition to several skeletons the mound has given up a wide variety of materials: copper axes, copper-covered human head masks, stone T-shaped and effigy pipes, maces, boatstones, sheet copper plaques and ornaments, engraved conch shells, textiles, wickerwork and coiled basketry, cane matting, stone and pottery vessels, and great quantities of shell and pearl beads.

From 1933 to 1935 most of the mound's contents were removed without scientific investigation and distributed commercially among collectors and dealers. Subsequently, investigation of the mound was completed by the University of Oklahoma.

From Mr. Harry M. Trowbridge of Kansas City, Kansas, the Smithsonian Institution has recently acquired an outstanding collection of articles from the Spiro mound. These include an exceptional series of rabbit-hair and feather textiles, some of which have been painstakingly unfolded by Mr. Trowbridge. Several of the textiles are more than three or four feet in length and one appears to be a fringe skirt with tie cords at each end. These specimens all await expert analysis and technical description.

In addition to the textiles, the recent acquisition includes a variety of work in shell. Four small cameos, for example, bear human faces in bas-relief. A group of conch shells carry a wide assortment of designs, ranging from scenes and characters (some ceremonially garbed) to symbols and motifs doubtless relating to the religion and mythology of the Spiro natives, but also in some cases reminiscent of aboriginal Mexican art. Among the motifs are plumed or horned serpents and rattlesnakes, trophy heads, spiders, turkeys, eagles, the eye-in-hand, the weeping eye, fish, the quartered circle, and speech scrolls.

Lemnos, the Aigeian Isle

Down from Heaven, so men tell
All day long Hephaistos fell.
If he landed where they say,
Therma's rocks of nobbly grey
On the stoniest isle of all,
Then he had a nasty fall.

Poor Hephaistos gazed around
On the barren, tawny ground.
"If this has to be the place
"Of my most unjust disgrace,
"Let me live in Kastro, truly,
"Spare me meals in Kontopouli!"

"No," said Zeus from out a cloud,
"Nice hotels are not allowed.
"On the bare north coast you'll stay
"Where the winds from Thrace all day
"Fleck with white the dark blue main,
"Till you find your place again."

DAPHNE HEREWARD

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REVIEWS OF RECENT BOOKS

DIGGING UP JERICHO, The Results of the Jericho Excavations 1952-1956, by KATHLEEN M. KENYON. 272 pages, 18 figures, frontispiece, 64 plates. Frederick A. Praeger, New York 1957 $5.00

Since 1867 the large mound of Tell es-Sultan beside a generous spring in the Dead Sea valley below Jerusalem (commonly assumed to have been the site of Joshua's Jericho) has been the scene of excavations by at least four different groups of archaeologists. The most recent activity at Tell es-Sultan was initiated by Dr. Kathleen M. Kenyon for the British School of Archaeology in Jerusalem, with participation by the American School of Oriental Research for three of the four years under description, and of the Royal Ontario Museum during the fourth year. Miss Kenyon's book intends to describe the main results of her first four seasons' work on the mound, "as a preliminary to the full scientific report." The book can hardly be called "popular" in view of the compacted detailed description of the architectural and stratigraphic complications of the site. Nor does Miss Kenyon go in for window-dressing; she is forthright in admitting that "not a trace remains" of the walls which confronted Joshua, and precious little of any occupation pertinent to the period of the Israelite invasion.

A fair share of the book is taken up with the description of the expedition's work in the very exciting prehistoric levels of the mound. That Miss Kenyon and this reviewer differ on the over-all implications of Tell es-Sultan's prehistory is immaterial here (cf. *Antiquity* XXXI [1957] 73-84), save that the reviewer's insistence on a "short chronology" generally has had to be abandoned (*Science* 127 [1958] 1419-1430) in view of subsequent developments in radiocarbon dating. The book also accounts for the intricacies of the site's development during the third and early second millennia. The remarkably well preserved contents of a series of "middle bronze age" tombs are described in a way which gives more feeling of aliveness than is usually possible in delineating the traces of extinct cultures.

Miss Kenyon is an exquisitely fine digger, and this competence shows well in the photographs of the various exposures made by her expedition. On the interpretative side she has—to this reviewer's taste—a rather old-fashioned penchant for "shrines," "invaders," and "pottery people." If, as she says, "common everyday pots are the most sensitive barometer of a drastic change in population," then the virtual replacement of most of the pottery in the Near East during the last fifty years by the products made by *tinikajis* from five-gallon gasoline tins should indicate a very wholesale population change. But idiosyncrasies in interpretation need not detract from the value of a workmanlike interim report on a very complicated site by a very accomplished excavator.

ROBERT J. BRAIDWOOD
Oriental Institute
University of Chicago

SICILY BEFORE THE GREEKS, by L. BERNABÒ BREA. 258 pages, 50 figures, 78 plates. Frederick A. Praeger, New York 1958 (Ancient Peoples and Places, edited by Glyn Daniel) $5.00

Ancient Peoples and Places is a series which excels in choice of authors and subjects. The former are expert, the latter hitherto not well represented in the popular archaeological literature. L. Bernabò Brea, well known as a dynamic leader in prehistoric studies of the Mediterranean world, tells the story of Sicily, from the first appearance of man to the arrival of Greek colonists, with loving knowledge of the land, yet keeps his picture of the great island in focus against a background of larger horizons stretching from Gibraltar to the Bosporus, from Spain to Syria and Cilicia. He has some spectacular material to report, such as the recently (1950) discovered engravings of the Old Stone Age or the considerable finds of Mycenaean pottery in the Lipari islands; and he has a brilliant chapter on Sicily and the Lipari islands in the "Dark Ages" of the late second and early first millennia before Christ.

In prehistory and in history the major interest of Sicily lies in its role as meeting-point between east and west, north and south. As Bernabò Brea is thoroughly versed in the archaeologies of the various cultures which radiated into Sicily, important new correlations emerge.

The book is equally useful as a readable introduction, a compact handbook, and an up-to-date review of the status of research on prehistoric Sicily.

GEORGE M. A. HANFMANN
Harvard University

INDIAN ART OF MEXICO AND CENTRAL AMERICA, by MIGUEL COVARRUBIAS. xvi, 360, xvii pages, 146 figures, 64 plates. Alfred A. Knopf, New York 1957 $17.50

The unexpected and tragic death of artist-anthropologist Miguel Covarrubias has cut short a magnificent trilogy on the aboriginal art of the Americas from the Arctic to the tip of South America. The first of the three volumes, *The Eagle, the Jaguar and the Serpent,* appeared in 1954. The book under review is the second in the series. The volume on South America will unhappily never be completed.

While much has been written about the archaeology of Mexico and Central America, this is the first time that the subject has been approached from the point of view of the artist, a fresh and much-needed viewpoint. All the color plates and magnificent line drawings

are the work of the author. At the end of the book is "An Album of Photographs." This illustrates for the first time many specimens from American and European museums and private collections. Superb examples of Middle American art from the author's own collection have also been included.

The book is divided into three sections on the basis of chronology, beginning with the first agriculturists and concluding with the arrival of the Spanish *conquistadores*. The first section, devoted to the Pre-Classic cultures, has an excellent chapter on the "Olmec problem," a subject of particular interest to the author, who believed that this was the "mother culture" of all subsequent Middle American developments. The same section contains a fine survey of the cultures of Western Mexico which, in the reviewer's opinion, is the best summary to date of this little known area.

The section on the Classic period, the time of the great theocracies, discusses the development of Teotihuacan and the cultures of the Valley of Oaxaca. It is followed by a description of the Gulf Coast area and by a fine chapter on the Maya. It is only regrettable that while ample attention has been given to the art of the Lowland Maya, little space is devoted to the equally important artistic and cultural development of the Highland and Pacific Coast Maya.

The Historical period section contains chapters on the Toltecs, the Mixtecs and the development of the Aztec Empire.

Owing to its unique approach and superb illustrations this is a book to be highly recommended to the artist, the anthropologist and the general reader.

STEPHAN F. DE BORHEGYI
Milwaukee Public Museum

THE PREHISTORY OF EASTERN EUROPE. Part I: Mesolithic, Neolithic and Copper Age Cultures in Russia and the Baltic Area, by MARIJA GIMBUTAS. ix, 241 pages, 126 figures, 50 plates, 5 tables. Peabody Museum, Harvard University, Cambridge 1956 (American School of Prehistoric Research, Bulletin 20) $7.50

This very impressive monograph is the first of a projected three-volume study which attempts "to evaluate and summarize the work done in Poland, the former East Prussia, Lithuania, Latvia, Estonia, Finland, White Russia (Bielo Russia), Russia, the Ukraine, and the Northern Caucasus." It covers the time span from the Late Glacial period to about 1700 B.C. The subsequent volumes are to embrace the Bronze and Iron Ages.

For anyone interested in the prehistory of this area, Dr. Gimbutas has performed a monumental service. She has not only winnowed a tremendous mass of not easily available published data in a variety of languages, the diversity of which has up to now been a barrier to comprehensive treatment, but she has also presented well illustrated, characteristic and recognizable assemblages as cross-sections of given periods and cultures along with maps of their geographic distributions. This is the first extensive coverage of the archaeology of the whole East European Plain.

In a work of this magnitude there are, of course, bound to be areas of disagreement with specific points of interpretation. Some unevenness, fur-

SUMMER PROGRAM, 1959

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thermore, is unavoidable because of the very slight amount of information available concerning some large regions as compared with certain intensively studied smaller districts. These, however, are minor matters, for the author has presented an impressive bibliography for each section, so that the serious student can delve more deeply into any particular problem.

In general, this is a well organized, intelligible, and massive approach to the archaeology of Eastern Europe. It is indispensable both as an introduction and as a survey. Dr. Gimbutas is to be congratulated on Volume I. We look forward with pleasure to the appearance of Volumes II and III and hope that they will not be too long delayed.

ROBERT W. EHRICH
Brooklyn College

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THE ROCK PICTURES OF EUROPE, by HERBERT KÜHN. Translated from the German by ALAN HOUGHTON BRODRICK. xxx, 230 pages, 144 figures, 91 plates, 1 map. Essential Books, Fair Lawn, New Jersey 1957 $7.00

This book is an up-to-date rearrangement of previous works by the same author. It is well illustrated and sums up our present general knowledge of prehistoric European art.

The author calls Palaeolithic art "sensorial" because "it reproduces exactly what the eyes saw," while the art of the metal ages he calls "imaginative" because it is composed of symbols and conventional signs. The art of the Neolithic age stands between. Although the general approach is certainly correct, it must not be forgotten that there exists a rich repertory of imaginative symbolic art dating from Palaeolithic times (e.g., La Pileta, Peche-Merle, etc.), while in the Bronze and Iron ages several cases of sensorial illustrative art are known (e.g., Val Camonica).

The book is divided into three main parts, the first dealing with "pictures of the Ice Age to 10,000 B.C.," Franco-Cantabrian art and its ramifications in South Spain, Germany and Italy. The second part, "pictures dating from between 10,000 and 2000 B.C.," includes Spanish Levantine art and the "sensorial rock pictures of Scandinavia." In dating Levantine art the author follows those who do not accept the Palaeolithic date established by the Abbé Breuil. The third part deals with "pictures of the second and first millennia B.C." and includes the schematic art of South Spain and Portugal, the rock pictures of Italy (including mainly Mount Bego and Val Camonica), France (including Île-de-France and the Midi) and Russia (Lake Onega and the White Sea).

The author repeatedly stresses the idea that all prehistoric art was dictated by religious aims. This is true of part, perhaps even a large part, of this art. In many places, however, descriptive art is also found, and therefore we cannot agree with this generalization. Just to give two examples, both in Spanish Levantine art and in the Camunian art we find hundreds of figures which quite certainly have nothing to do with religion: in Spain representations of men running, climbing trees, gathering honey or waging war; in the Camonica Valley pictures of pastoral and agricultural life, of battles, and other scenes of daily life.

There is some unevenness in the treatment. For instance, the art of Mount Bego and the Val Camonica, together, are dealt with in seven pages, while more than twenty pages are devoted to the schematic art of Andalusia, with which the author is apparently much better acquainted.

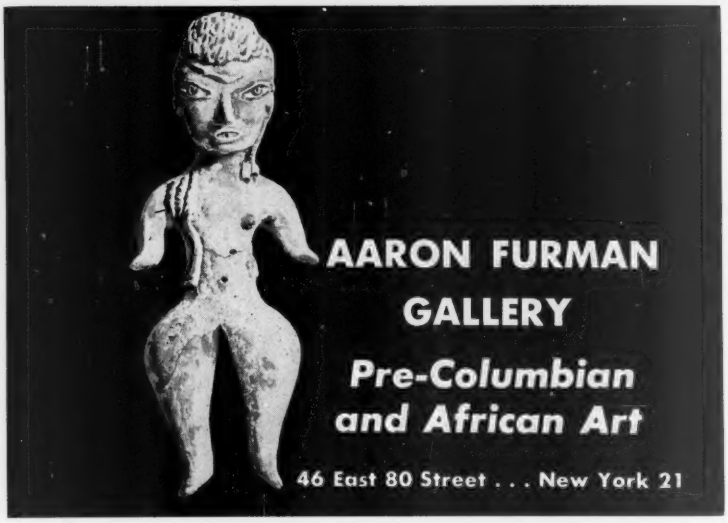
The most important part of the book is certainly that dealing with the interpretation of schematic and imaginative art. The author depicts brilliantly the animistic and mythological background of this art and its importance for understanding the beliefs and superstitions of its primitive creators. Despite some differences of opinion, we believe that Kühn's work is an important contribution to the creation of a general view on the subject of the rock pictures of Europe. The book is written simply and clearly, and Professor Kühn has succeeded in presenting an account both scientific and pleasant to read. The student as well as the layman will find here a basis for wider study and some new and interesting ideas.

EMMANUEL ANATI
Department of Antiquities
Jerusalem, Israel

DATED BUDDHA IMAGES OF NORTHERN SIAM, by A. B. GRISWOLD. 97 pages, 12 figures, 57 plates. Artibus Asiae, Ascona, Switzerland 1957 $8.50

The persistent demands of a precise and clearly formulated, if strictly limited, Hinayana iconography have resulted in a striking similarity among Siamese Buddhist images over the centuries. However satisfactory to worshipers, this has been confounding to art historians.

Here is a chapter of Buddhist sculpture that perpetuates the ideal as crystallized a millennium before during the Gupta period in India. Here is a Buddha type in which the abstractions of



physique and drapery owe nothing to Gandhara, Rome or Greece.

The power of precedent, to be expected in Buddhist art anywhere, is never so strong as in the Buddha icon. The shape of the skull with protruding *usnisa*, the exaggeration of facial features, the long-lobed ears, the yoga posture on the lotus throne and so on are prescribed by canon. The logical formulation of any theory of stylistic trends and the actual dating of specimens have therefore been most difficult.

The author of this study has performed a great service in seeking and cataloguing over a hundred dated specimens. Some eighty of these are handsomely illustrated in chronological order. These form a unique and valuable body of reference material from the mid-fifteenth century to modern times. This alone is a contribution to scholarship. The catalogue, however, is but one feature of a delightfully written and informative book.

The tenuous yet theoretically necessary connection with the legendary Udhayana image of Buddha's lifetime is indicated. An important direct Indian impact is shown in a detailed description of the Seven Spires Monastery, a replica of the ancient temple at Bodhgaya built at Chiengmai in 1455 by King Tiloka, which just predates the body of images in this book. The stylistic heritage is shown to be interwoven with earlier Dvāravatī, Mon-Khmer, Burmese and Singhalese examples, as well as with the Indian Pala and still earlier Gupta prototypes. Even while convincing the reader that a chronological sequence can be seen in the royally commissioned images, the author points out its likely coincidence with a sequence of another sort, one spreading out from the royal to the folk images. With further penetration he discusses the nature of image making as the perpetuation of a vision—the beholding of that vision by a monk in trance at the moment that the caster pours the molten metal—and the dependence of quality on a subtle balance between patron and craftsman.

Copious comparative sketches in the Appendix help further to broaden the scope of a delightful monograph, written with penetration and imagination.

JAMES M. PLUMER
University of Michigan

THE ROCK-SHELTER OF LA COLOMBIÈRE, Archaeological and Geological Investigations of an Upper Périgordian Site near Poncin (Ain), by HALLAM L. MOVIUS, JR. and SHELDON JUDSON, with a Report on the Fauna by HENRI GAUTHIER and a French Résumé by FRANÇOIS H. BORDES. x, 176 pages, 52 figures, 6 tables, maps. Peabody Museum, Harvard University, Cambridge 1956 (American School of Prehistoric Research, Bulletin No. 19) $4.85

This volume is a comprehensive report on the excavation of an Upper Palaeolithic rock shelter in the valley of the Ain River, an eastern tributary of the Rhone, and on the attempt to establish a precise geological date for the cultural deposits with relation to the fluctuations of the last glaciation. Earlier excavations (in 1913 and 1914) had revealed cultural remains of the Périgordian period as well as of an overlying Magdalenian layer, which was removed.

The excavations here described took place in 1948 and dealt with Upper Périgordian deposits. The chief assemblage from La Colombière is contemporary with Upper Aurignacian but has its closest affinities with southwestern France, from which it is separated by the Massif Central. Its exact dating remains in question both with regard to the Würm oscillations and to radiocarbon dates which the authors believe must be from contaminated samples. In their opinion, the Upper Périgordian occupation must have antedated the Bühl stage, thus possibly equating with Würm II, but they were unable to establish this point with any certainty.

Culturally the site seems to have served either as an intermittently occupied shelter or as a camp for hunters who migrated seasonally between the western plains and low plateaus, and the mountains of the southern Jura. The flint industry seems definitely earlier than fully developed Solutrean and accords well with Phases IV and V of Peyrony's Périgordian sequence. In addition La Colombière has contributed significantly to the corpus of Upper Palaeolithic small art. The early excavators found two pieces of engraved mammoth bone and nine engraved pebbles. The tenth—and most important—one, with several superimposed animals on each side, turned up in the excavations of 1948.

The chief appeal of this monograph is for those with a particular interest in the Upper Palaeolithic. Technically it is a model report.

ROBERT W. EHRICH
Brooklyn College

FINDING FOSSIL MAN, by ROBIN PLACE. 126 pages, 46 figures, 31 plates, 1 chart. Philosophical Library, New York 1957 $7.50

This brief book is generally concerned with the course of human evolution, half of it being devoted to general zoology with stress on primate characteristics and the primate developmental line. Very little space is

given to early cultures, though the material which appears is well coordinated with that on the associated human fossils. The discourse is well illustrated with line drawings and halftones.

Only two criticisms may be made of an otherwise good job. To this reviewer Miss Place seems to be writing down to her audience, though the book is, according to the dust-jacket, primarily intended for secondary school and evening class students. The publishers certainly don't seem to be directing their efforts toward this readership in pricing their product; few students could afford the book.

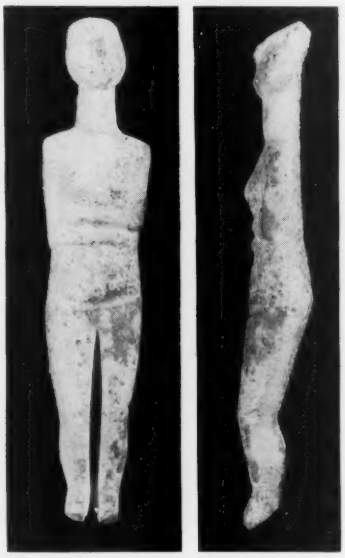
ROBERT F. G. SPIER
University of Missouri

CITY IN THE SAND, by MARY CHUBB. 213 pages, 26 figures, 1 map. Thomas Y. Crowell, New York 1957 $3.95

Since the beginnings of modern archaeology in the Near East, scientific publications have been paralleled by accounts of excavators' personal experiences. The early memoirs were by rough and ready pioneers, exploring in remote and exotic countries. Today such memoirs tend to have a milder flavor, a result of the less adventurous character which archaeology has assumed as it has grown into a scientific discipline, and as the Near East has become more accessible. These changes allow the participation of women and there has grown up a genre of memoirs of field work written by women, beginning with Agatha Christie Mallowan's *Come, Tell Me How You Live.*

The latest of this genre is a most charming and outstanding example of its kind. Mary Chubb's first experience with archaeological work was with the Egypt Exploration Society in London; she later participated in its expedition to el Amarna and made her experiences the subject of her first book, *Nefertiti Lived Here.* Her new volume begins and ends with her travels in Greece and Crete on the way to and from the Iraq expedition of the Oriental Institute of the University of Chicago. Most of the book, however, is devoted to her first season as secretary of that expedition, which dug in Iraq between 1929 and 1937 at the famous Assyrian site of Khorsabad and also at four sites in the Diyala region near Baghdad. Miss Chubb describes how the Diyala excavations clarified the chronological framework and cultural development of early Mesopotamian civilization. The careful digging of stratified mud-brick buildings and their correlation with written evidence, the revelation of the life and beliefs of ancient Mesopotamians and their connections with foreign lands—these aspects of scientific work are woven together with other aspects of expedition life into a humorous and lively narrative.

With great sensitivity Miss Chubb describes many facets of her surroundings: the moods of the lonely desert around Tell Asmar, the feeling of isolation, heightened almost into terror during a violent dust storm, the contrast between the flat southern country and the more verdant land north of Mosul where Khorsabad is located, the pink geraniums against the white walls of a Cretan village. She tells of comical circumstances arising from unusual conditions of life and work, of the idiosyncrasies of servants and workmen. She sketches the highly diversified character of the staff members and their comradeship as they worked together, and vividly recreates



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Cycladic fertility goddess. From the island of Paros. Marble (encrusted). End of third millennium. 7″ high.

the life and spirit of the expedition, which was so largely colored by the personality of its director, Henri Frankfort. One of the book's main achievements is that it conveys an impression of his brilliance, intensity and deep humanity.

A few minor inaccuracies have crept in. Thus Miss Chubb writes that the colossal winged bull from Khorsabad "was sawn into several pieces" for shipment to Chicago. In fact, the large blocks into which it had been broken in ancient times were shipped as found in spite of tremendous difficulties, and consequently the sculpture could be set up in the Oriental Institute Museum unmarred by a saw. Such rare slips detract not at all from the merits of the volume.

This book, its gaiety and humor not lessened by its more serious side, should entrance any reader, but it will move more deeply those who know that two of its protagonists, Pendlebury and Frankfort, whose portraits are drawn so affectionately, died at tragically early ages. By portraying them at the height of their vigor, unclouded by coming shadows, Miss Chubb has produced not only an informative and entertaining book but also a moving and inspiring one.

HELENE J. KANTOR
The Oriental Institute
University of Chicago

BRIEF NOTICES

ROMAN GLASS FROM DATED FINDS, by C. ISINGS. viii, 185 pages, 134 text figures. J. B. Wolters, Groningen/Djakarta, 1957 (Archaeologia Traiectina, II)

A compendium of glass vessels from datable contexts, which will be useful in guiding both excavators and students to the relevant literature. Considering the diffusion of the material and the difficulties of classification, the results are most praiseworthy.

DIE ENTSTEHUNG DES ANTIKEN REPRÄSENTATIONSBILDES, by LUDWIG BUDDE. 26 pages, 66 plates. Walter de Gruyter, Berlin 1957 DM 12

Taking the obelisk of Theodosius in Istanbul and the imperial mosaics in S. Vitale, Ravenna, as examples of where late antique official composition led, analysis is carried back to the Antonine and Severan periods of the Roman Empire. The arch of the Argentarii in Rome and other triumphal sculptures of A.D. 180-230 have elements of organization with roots in early imperial frescos, funerary reliefs and decorative sculptures. Severan imperial portraits are datable monuments of this aspect of transition to late Classical design; coins, especially reverse types, confirm what reliefs, mosaics and frescos from Rome to Dura show. The footnotes are a mine of information, and the plates are excellent.

THE STORY OF ARCHAEOLOGY, by AGNES ALLEN. 245 pages, 83 figures. Philosophical Library, New York 1958 $4.75

This quick survey of the field of archaeology touches upon the obvious high spots of discovery: the Palaeolithic with its industries and art; the European Mesolithic, Neolithic, Bronze and Iron ages; the tombs and temples, together with the treasure of Tutankhamen, in Egypt, the monuments of Mesopotamia, Troy, Mycenae and Knossos, the great cities and monuments of the Classical world. After a glance at Roman and Saxon England, the survey concludes with notes on the Dead Sea Scrolls.

IMOLA NELL' ANTICHITÀ, by FAUSTO MANCINI, GUIDO A. MANSUELLI, and GIANCARLO SUSINI. 263 pages, 27 plates, one in color, 3 plans. De Simone, Rome 1957 (Storia di Imola, Vol. I)

The results of some years of original investigation are included in this volume. After a brief survey of the geography and geology of the region and a fuller treatment of its prehistory, the history, culture, population, city-plan and art of the Roman Forum Corneli and its area are treated. Appendices present lists of excavations and discoveries, historical sources, prosopography and the survivals of ancient place-names.

LASCAUX AND CARNAC, by GLYN DANIEL. 127 pages, 13 figures, 14 plates. The Macmillan Company, New York 1957 $3.00

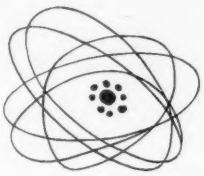
Glyn Daniel has provided a unique guide to the Palaeolithic cave and megalithic monument area of France. For the most part, this attractive book describes the approach to and the facilities at the famous sites. Scattered throughout the book, however, are interesting remarks and descriptions of these sites, as well as some discussion as to their place in the prehistoric sequence of the Old World. For those interested in the archaeology of southern France and in good food, lodging, drink and travel while there, this book is most useful.

WERKSTÄTTEN ORIENTALISIERENDER KERAMIK AUF RHODOS, by WOLFGANG SCHIERING. vii, 151 pages, 5 text-figures, 11 figures, 16 plates. Verlag Gebr. Mann, Berlin 1958 (Deutsches Archäologisches Institut)

Although Rhodian ware is one of the more important orientalizing fabrics of Greece, it has not previously been treated at monograph length. Here are the results of a thorough study of Rhodian pottery. Rhodian ware is divided into an early orientalizing group, 700-650 B.C., and a later group in which three workshops are recognized—the Kamiros Group, the Euphorbos Group and the Vlastos Group, all in production roughly from the mid-seventh to the mid-sixth century. Shape and decoration are carefully analyzed and well illustrated. The plates are somewhat scant to give a full picture of Rhodian ware; the use of human forms in the three main groups is hardly illustrated at all. Schiering's work will go far toward increasing understanding and appreciation of the Rhodian workshops.

MAUSOLEI ROMANI IN CAMPANIA, by ALFONSO DE FRANCISCIS and ROBERTO PANE. 129 pages, including 89 illustrations. Edizioni Scientifiche Italiane, Naples 1957 2500 lire

These chamber tomb monuments, with decorative architectural features, often quite freely, and sometimes even fancifully, applied, are characteristic of the burial areas flanking important highways in Campania, especially at Pompeii, Pozzuoli, Naples and vicinity, Capua and Alife. They present certain features of Roman architecture more adequately than the surviving monuments of Rome itself. More than twenty of them are here published, and their aesthetics are appraised as manifestations of the "ancient Barocco."



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Archaeologically they will have had rich fare indeed—the Ifugao rice terraces of Luzon, Angkor Wat and Angkor Thom, the Hindu temples of Bhuvaneswar, Konarak and its Sun Temple, Mahabalipuram, Anuradhapura and Polonnaruwa in northern Ceylon, the Ellora and Ajanta Caves, Fatehpur Sikri, Greco-Buddhist Taxila, Persepolis, Babylon, Ctesiphon, Baalbek, Jerash, and fabled Petra and the Valley of the Nile.

A limited number of registrations are available for the 1960 tour. In Mr. Ferguson's absence details can be obtained from Mr. Ferguson's assistant, Mrs. C. W. Graydon, Katonah, Westchester County, New York.

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